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Power

Ref.: APL/Udupi/P-I/ENV/EC/MoEFCC/225/11/23
Date: 23/11/2023

To,
Additional Principal Chief Conservator of Forest
Ministry of Environment, Forest and Climate Change
Regional Office (Southern Zone)
Kendriya Sadan, Koramangala,
Bangalore – 560 034

Sub: **Submission of Six Monthly EC compliance report & CRZ Compliance report for 2x600 MW Thermal Power Plant of Udupi Power Corporation Limited (UPCL)**

Ref: Environmental Clearance No: **J-13011/23/1996-IA.II (T) Dated: 01.09.2011.**
CRZ Clearance No: **11-14/2010-IA-III dated: 18.05.2010**

Dear Sir,

With reference to above subject, please find enclosed herewith the Six-monthly compliance report for the period of **April'2023 to September'2023** against the conditions of Consolidated Environmental Clearance for **2x600 MW Udupi Thermal Power Plant** and CRZ Clearance granted to UPCL for Sea Water Pipe-Line intake system, through **e-mail.**

Thanking you,
Yours sincerely,
for **Adani Power Limited, Udupi**

(Santosh Kumar Singh)
Authorized Signatory

Encl: As above

CC:

The Member Secretary,
Central Pollution Control Board,
Parivesh Bhavan, East Arjun Nagar,
Kendriya Paryavaran Bhawan, New Delhi – 110 032

Zonal Office,
Central Pollution Control Board,
1st and 2nd Floor, Nisarga Bhavan, A-Block, Thimmaiah Main Road, 7th Cross, Shivanagar, Bengaluru – 560 010

The Member Secretary
Karnataka State Pollution Control Board
"Parisara Bhavan", #49, 4th & 5th Floor,
Church Street, Bangalore – 560 001

Regional Office,
Karnataka State Pollution Control Board.
Plot no-36-C, Shivalli Industrial Area,
Manipal, Udupi – 576 104

Adani Power Ltd
Adani Corporate House
Shantigram, S G Highway
Ahmedabad 382 421
Gujarat, India
CIN: L40100GJ1996PLC030533

Tel +91 79 2555 4444
Fax +91 79 2555 7177
www.adanipower.com

SIX MONTHLY COMPLIANCE REPORT OF ENVIRONMENT CLEARANCE (EC) AND CRZ CLEARANCE OF SEA WATER PIPELINE

FOR

1200 (2x600) MW
Udupi Thermal Power Plant

At

Village Yelluru, Pilar Post,
Padubidri, Udupi District, Karnataka

Submitted to:

Integrated Regional Office, Bengaluru
Ministry of Environment, Forests & Climate Change
Zonal Office, Central Pollution Control Board
Karnataka State Pollution Control Board

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Submitted by:

Environment Management Department

Adani Power Limited

Village Yelluru, Pilar Post,
Padubidri, Udupi District, Karnataka

Period: April'2023 to September'2023

CONTENTS

Introduction

Udupi TPP of Adani Power Limited with capacity of 2X600 MW is imported Coal based Power Plant in the Udupi District of Karnataka. Situated in the western coastal region of India, the plant is situated in the village of Yellur, between Mangalore and Udupi.

Udupi TPP is the first independent power project (IPP) using 100% imported coal as fuel in the country. The Udupi Power Project supplies 90% of the power it generates to the State of Karnataka.

Location of the Project

State	Karnataka
District	Udupi
Village	Yelluru (in Padubidri Industrial Area)
Geographical Coordinates	$13^0 9' 00''$ N $74^0 47' 00''$ E $13^0 10' 30''$ N $74^0 48' 40''$ E

Both units of 600 MW have been installed as sub critical coal fired steam generator each connected to a reheat type condensing steam turbine and generator with water cooled condenser and all other required auxiliaries. Each steam generator of 600MW is rated to generate about 2028 tons/hour of superheated steam at a pressure of about 175 kg/cm^2 and superheat temperature of 540^{0}C. The steam generators are equipped with facilities for HFO/LDO firing for startup and flame stabilization at low loads. Each steam turbine is 3000 rpm rated speed, tandem compound, single re-heat, condensing type machine with extractions for regenerative feed water heating. The turbine is designed for main stream pressure of 170 kg/cm^2 (a) and inlet temperature of 537^{0}C.

Being coastal area with perennial availability of seawater, usage of seawater is envisaged for condenser cooling and freshwater requirement. Re-circulating type of circulating water (CW) system with natural draft cooling towers is installed. Due to availability of Fresh water in this area is seasonal and limited; desalination of seawater is installed for meeting the freshwater requirement for the plant. About 10000 m^3/hr of makeup sea water is required for both the Unit-1 & Unit-2.

The plant has all latest Pollution Control Equipment like, High Efficiency ESP's, Flue gas desulphurization plant, Low NO_X burners and 275 m height chimney.

Environmental Clearances from Ministry of Environment & Forest (MoEF&CC), Consent to Establish and Consent for Operation (CFO) from Karnataka State Pollution Control Board (KSPCB). Udupi TPP has also obtained all necessary statutory/mandatory clearances.

Ambient Air quality Monitoring Stations were established in 4 locations inside the plant area for continuous monitoring of Ambient Air Quality. One meteorological station has also been installed for monitoring of meteorological data. Udupi TPP is monitoring the environmental parameters in and around the plant area through NABL accredited Laboratory.

Environmental clearance was accorded to the project for 2x500 MW with imported Coal based units on 20 March 1997. This EC was amended on 25 Jan 1999 and 09 Sept 2009 permitting enhancement of capacity to 2x507.5 MW and subsequently to 2x600 MW. These amendments in EC were consolidated on 01 Sept 2011 by MoEF&CC.

The Hon'ble NCLT vide its order dated 08.02.2023 sanctioning the scheme of amalgamation/merger of Udupi Power Corporation Ltd. with **Adani Power Limited.**

Subsequently, **transfer of Environment Clearance** from **Udupi Power Corporation Ltd. to Adani Power Limited** is granted from MoEFCC, New Delhi **vide file no. J-13012/12/2015-IA.I (T) dated 26th June 2023.**

Detailed compliance status of Consolidated Environment Clearance from MoEF&CC for **2X600 MW Coal based Subcritical Thermal Power plant and CRZ Clearance** from State Coastal Zone Management Authority for Sea Water Pipeline is being furnished herewith.

Compliance Status on Environmental Clearance
1200 (2×600) MW Coal Based Thermal Power Plant
Environment Clearance vide no. J-13011/23/1996-IA.II (T)
EC Transfer from UPCL to APL dated 26.06.2023

Sl.No.	Conditions	Compliance Status
A	**Specific Conditions**	
(I)	All the conditions stipulated by the Karnataka State Pollution Control Board issued from time to time should be strictly implemented including the installation of Flue Gas Desulphurization (FGD) Plant. The status of implementation of FGD shall be submitted to the Regional Office of the Ministry at Bangalore.	Complied. All the conditions stipulated by KSPCB are implemented. FGD units are commissioned and are in operation from the inception of Unit-1 & Unit-2 boilers. Unit-I: 11th November 2010 Unit-II: 19th August 2012 As per the MoEF&CC notification no. G.S.R.682 (E) dated: 05.09.2022 timeline for compliance for SO_2 emissions for Category C TPPs is 31st December 2026. As per the above notification by MoEF&CC, dismantling work of the existing FGD units (with capacity of 25% of flue gas) has commenced from November 2022. New FGD units will be installed to comply with SO_2 emission standard within the notified timelines.
(II)	Sulphur and ash contents in the coal to be used in the project shall not exceed 0.8% and 12 % (average) respectively at any given time. In case of variation of coal quality at any point of time, fresh reference shall be made to the Ministry	Complied for both Sulphur and Ash contents. Average Sulphur and Ash content in coal used for the period of April'2023 to September'2023 is as below: 1. Sulphur Content: **0.54 %** 2. Ash Content: **5.68 %**
(III)	A single bi-flue stack of 275 m height shall be provided with continuous online monitoring equipment's of SO_x, NO_x and Particulate Matter ($PM_{2.5}$ & PM_{10}). Exit velocity of flue gases shall not be less than 22 m/sec. Mercury emissions from stack shall also be monitored on periodic basis.	Complied A Single bi-flue stack of 275 m height is provided with continuous online monitoring for SO_2, NO_x, Particulate Matter and Mercury. Exit velocity of the flue gases from the stack for the period of April'2023 to September'2023 was **23.30 to 26.90 m/s**.
(IV)	An instrumented meteorological tower shall be set up for collecting on-site meteorological data.	Complied An instrumented meteorological tower is established for online meteorological data.

		Meteorological data for the period of April'2023 to September'2023 is enclosed as **Annexure-I**.
(V)	High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission from the proposed plant does not exceed 50 mg / NM^3. Low NO_x Burners shall be installed.	Complied High Efficiency Electrostatic Precipitators and low NOx Burners are installed. Particulate emissions from the plant are well within the limits. Monitoring reports for the period of April'2023 to September'2023 is enclosed as **Annexure-I**
(VI)	Adequate dust extraction system such as cyclones / bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.	Complied Water Sprinklers are provided in coal yard, coal unloading and coal conveyor systems. Dust Extraction system has been provided at Junction towers. Dry Fog dust suppression system is provided in track hopper and bunkers. Wind Shield has been provided; photograph enclosed as **Annexure-II.**
(VII)	Transportation of coal from Mangalore Port to the project site shall be undertaken by rail with adequate provisions to prevent fugitive emissions	Complied Coal is transported from Mangalore port to plant site is only through rail by BORBN wagons. Wagons are covered with tarpaulin sheets to prevent fugitive emission during transportation.
(VIII)	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Unutilized fly ash shall be disposed off in the ash pond in the form of slurry. Mercury and other heavy metals (As, Hg, Cr, Pb etc.) will be monitored in the bottom ash as also in the effluents emanating from the existing ash pond. No ash shall be disposed off in low lying area. To prevent ground water contamination, the ash pond area should be lined with impervious layer.	Complied Fly ash is collected in dry form and stored in ash Silos. All the generated fly ash is being supplied to the end users like Cement, RMC, Brick manufactures etc. Fly Ash Utilization details enclosed as **Annexure-III**. Ash pond is lined with LDPE film as impervious layer to avoid ground water contamination. Mercury and other heavy metals are monitored in the bottom ash through NABL accredited laboratory. No effluent is emanated from ash pond. No ash is disposed in the low-lying areas. Test wells are constructed around the ash pond area for water monitoring and monitoring reports for the period of April'2023 to September'2023 is enclosed as **Annexure-I.**

(IX)	The transportation of dry fly ash to the ash disposal area through closed bulkers shall be allowed till 30.03.2012 till the Cement Grinding unit of M/s ACC Ltd. is set up. Monitoring of particulate emissions along the route of transportation shall be carried out	Complied Cement blending unit has installed within the plant near to Ash silos and ash is transferred from silos to blending unit through closed conduit only. Particulate Emission Monitoring is carried out in transportation route. Four numbers of online ambient air quality monitoring stations are established for continuous ambient air quality (CAAQ) monitoring. AAQ monitoring is also done in transportation route and buffer zone through MoEFCC and NABL accredited laboratory. Air monitoring reports for the period of April'2023 to September'2023 is enclosed as **Annexure-I**.
(X)	Extensive monitoring of air quality in and around the power plant and extending up to Western Ghat should be carried out and records should be scientifically maintained. The monitoring Programme should cover the key stone species for any potential acid deposition effects.	Complied Air quality monitoring is carried through MoEF&CC and NABL accredited laboratory at 8 locations (extending up to Western Ghats) which is finalized in consultation with KSPCB and the monitoring reports are submitted to the KSPCB office monthly. The Monitoring programme covers till western Ghats and measure Sulphur dioxide and Nitrogen dioxide, as main precursors for acid rain. Key Stone Species Monitoring is carried once in six months. There is no change noticed. Air quality monitoring reports for the period of April'2023 to September'2023 is enclosed as **Annexure-I**.
(XI)	No leachate shall take place at any point of time from the Coal storage area and Ash Pond and adequate safety measures such as lining with impermeable membrane / liner shall be adopted. Precautionary measure shall be taken to protect the ash dyke from getting breached and in-built monitoring mechanism shall be formulated.	Complied LDPE film is used as impervious layer to avoid ground water contamination from Coal storage and Ash Pond area. Test wells are constructed around the ash pond area for water monitoring and monitoring reports for the period of April'2023 to September'2023 is enclosed as **Annexure-I,**
(XII)	Fugitive emission of fly ash (dry or wet) shall be controlled so that no	Complied

	agricultural or non-agricultural land is affected. Damage to any land shall be mitigated and suitable compensation provided in consultation with the local Panchayat.	Disposal of fly ash is handled through closed conduit within plant. No damage has happened to any land.
(XIII)	COC of at least 1.25 shall be adopted	Complied
(XIV)	Closed Circuit Cooling Tower shall be installed and sea water shall be used for cooling purpose. The sweet water requirement shall be met from the desalination plant.	Complied Closed circuit cooling tower is provided and sea water is used for cooling purpose. Desalination plant is provided for sweet water requirement.
(XV)	No effluent will be discharged into the Mulki River. The treated effluents shall be discharged through a pipeline in the Arabian Sea ensuring that the differential temperature is maintained at 5^0 C. The area and location of the intake and discharge point shall be finalized in consultation with the National Institute of Oceanography (NIO), Goa/Central Water and Power Research Station, Pune.	Complied No effluent is discharged into the Mulki River and there is no connection of Udupi TPP with Mulki River. All the cooling towers blow down and water outlets are discharged back to the sea from Guard Pond through Coro-coated MS-Pipe line at designated place which is finalized in consultation with NIO. The differential temperature is maintained within 5^0 C. All the intake and outfall sea water points are finalized as per recommendations of NIO, Goa.
(XVI)	Brine management from desalination plant, its disposal mechanism and status of implementation shall be submitted to the Regional Office of the Ministry from time to time.	Complied Guard pond has been established to collect all the water outlets. Brine from desalination plant is sent to Guard Pond and discharged to Sea. Continuous online monitoring system implemented in Guard Pond, in addition to that water sample is being collected and analyzed once a week by MoEF&CC and NABL accredited laboratory. Guard pond effluent monitoring reports for the period of April'2023 to September'2023 is enclosed as **Annexure-I**.
(XVII)	Possibility for setting up transit storage within plant site for temperature control of effluent before discharging to the sea shall be examined and details submitted to the Ministry **within six months.**	Complied Guard pond has been established to collect all the water outlets. Treated effluents, including blow down from the cooling towers are sent back to sea via Guard Pond.

		Effluent temperature maintained within 5^0 C before discharge.
(XVIII)	Monitoring of ground and surface water quality nearby shall be regularly conducted and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and or advised by the State Pollution Control Board and records maintained. Monitoring for heavy metals in ground water shall be undertaken.	Complied Ground water and Surface water monitoring is carried regularly in the locations finalized in consultation with KSPCB and records are maintained. Monitoring reports are sent to KSPCB once in every month. Monitoring of heavy metals in ground water is carried out monthly. Water monitoring reports for the period of April'2023 to September'2023 is enclosed as **Annexure-I**.
(XIX)	A well designed rainwater harvesting system shall be put in place which shall comprise of rain water collection from the built up and open area in the plant premises. Action plan and road map for implementation shall be submitted to the Regional Office of Ministry.	Three Numbers of Rainwater Harvesting ponds are constructed to harvest rainwater. Photos enclosed as **Annexure-IV**.
(XX)	The project proponent shall not hamper the vocation of the fishing community in the area (if any) and it shall be ensured that local fishing community shall be allowed to carry out their vocation. Clearance from the Department of Fisheries in the State Govt. shall be obtained.	Complied Fishing activity is not hampered. Monitoring of sea water around the intake and outfall points is carried regularly through College of Fisheries, Mangalore. NOC obtained from department of Fisheries, State government of Karnataka. Copy of NOC already submitted.
(XXI)	Acquisition of land should be restricted to 550 ha as per the following breakup:	Complied Following is the current status:

Plant area	180 Ha	Plant area	167 Ha
Ash Disposal Area	150 Ha	Ash Disposal Area	46 Ha
Colony Area	45 Ha	Colony Area	03 Ha
In take pipe route	25 Ha	In take pipe route	15 Ha
Other requirements	50 Ha	Other requirements	8 Ha
Rehabilitation, Green belts, Ash utilizations etc.	100 Ha	Rehabilitation, Green belts, Ash utilizations etc.,	82 Ha

<table>
<tr><td>(XXII)</td><td>Green belt of adequate width and density with suitably selected native species should be developed all around the plant area and the ash disposal site. Density of trees shall not be less than 2000 per ha and survival rate not less than 80%. It shall be ensured that at least 1/3rd of the total area is utilized for creation of green belt. Adequate financial provision should be made for this purpose.</td><td>Complied
Green belt of about 398505 saplings in 195 acres have been planted.
Survival rate of the plantation is ensured more than 80% by taking appropriate after care methods like Watering, apply manure etc. Snapshots of Plantation are enclosed as Annexure-V.
Adequate financial provision for the plantation under Environment budget is made separately. The amount spent for various activities under Environment for the period of April'2023 to September'2023.
<table>
<tr><th>Description</th><th>Amount (Rs.)</th></tr>
<tr><td>Afforestation</td><td>5357668</td></tr>
<tr><td>Environment Monitoring</td><td>2223389</td></tr>
<tr><td>General Environment Management</td><td>22438658</td></tr>
<tr><td>Total</td><td>30019715</td></tr>
</table></td></tr>
<tr><td>(XXIII)</td><td>Local employable youth from Project Affected Family shall be trained in skills relevant to the project for eventual employment in the project itself. The action taken report and details thereof to this effect shall be submitted to the Regional Office of the Ministry and the State Govt. Dept. concerned from time to time.</td><td>Complied
As per the recommendations from KIADB, project affected families are taken on employment and provided required trainings and skill developments.</td></tr>
<tr><td>(XXIV)</td><td>The project affected people should be rehabilitated and resettled in consultation with the State Govt. of Karnataka. A Rehabilitation Committee should be constituted with representatives from the state of Govt. of Karnataka, affected people, local recognized NGOs, technical institutions, experts etc.</td><td>Complied
Rehabilitation and Resettlement is already provided to the project affected people as per R&R policy of Government of Karnataka.</td></tr>
<tr><td>(XXV)</td><td>Status of implementation of R&R including its financial component spent and action pending shall be submitted to the regional Office of the Ministry from time to time.</td><td>Complied</td></tr>
<tr><td>(XXVI)</td><td>Financial requirements for implementations of the environmental mitigative measures should be</td><td>Complied</td></tr>
</table>

	earmarked and shall not be diverted for the other purposes. Adequate provision should be ensured for enhancement of funds required, if any, in future.	Financial requirement for Environmental mitigative measures was earmarked at the time of project as per EIA report and measures have been implemented. Operating expenses are earmarked in operation budget on yearly basis. In case of any future requirement funds will be provided as when required.
(XXVII)	The project proponent shall also adequately contribute in the development of the neighboring villages. Special package with implementation schedule for free potable drinking water supply in the nearby villages and schools shall be undertaken in a time bound manner.	Complied Potable drinking water supply through RO plant is done. The company is also providing assistance in Medical, Education and Infrastructural facilities etc., to the neighboring villages. Scholarships, green nurturing and school grants are also providing to nearby villages.
(XXVIII)	The project proponent shall formulate sustainable livelihood scheme for landless and marginalized section of society (such as landless farmers) in the area who are directly or indirectly affected due to power project.	Complied The Company has engaged local people for various activities like Green belt Development, Area development and other service works like catering etc.,
(XXIX)	At least three nearest village shall be examined for possible adoption and basic amenities like development of roads; drinking water supply, primary health centre, primary school etc shall be developed in co-ordination with the district administration	Complied Udupi TPP along with the District Administration has identified various schools in the neighboring villages for adoption and for providing basic amenities like toilet facilities, drinking water, green nurturing, etc.
(XXX)	An amount of Rs. 5.0 Crores shall be earmarked as one time capital cost for CSR programme. Subsequently a recurring expenditure of Rs. 1.0 Crores per annum till the life the plant shall be earmarked as recurring expenditure for CSR activities. Details of the activities to be undertaken shall be submitted within one month along with road map for implementation.	Complied Rs.5 crore was earmarked onetime cost for CSR during the project phase stage of 2x600 MW plant. Over Rs.1 crore is earmarked and used for all CSR activities every year.
(XXXI)	CSR scheme shall be identified based on need based assessment in and around the villages within 5.0 km of the site and in constant consultation with the village Panchayat and the District Administration. As part of CSR prior identification of local employable youth and eventual employment in the	Complied CSR schemes are identified based on need assessment and constant consultation with village Panchayat and the District Administration. CSR team is engaged for assessment and consultation with local

	project as required after imparting relevant training shall be also undertaken as necessary.	villages for CSR activities on a continuous basis. For local youth, scholarships and various other schemes including trainings are provided so as to get them proper education and getting eventual employment opportunities. Snapshots of CSR activities are enclosed as **Annexure-VI**.
(XXXII)	It shall be ensured that in-built monitoring mechanism for the schemes identified is in place and annual social audit shall be got done from the nearest government institute of repute in the region. The project proponent shall also submit the status of implementation of the scheme from time to time.	Complied Socio Economic study was carried at the project time as a part of EIA study. Impact assessment of CSR interventions is periodically done internally.
(XXXIII)	A Monitoring Committee should be constituted for reviewing the compliance to various safeguard measures by involving recognized local NGOs. Pollution Control Board, Institutions, Experts etc.	Monitoring Committee is framed comprises of NGO, College Experts and Institution Experts to review Safeguard measures implemented by Udupi TPP.
B	**General Conditions:**	
(I)	A Corporate Environmental Policy shall be formulated and after due approval of the Board of Directors of the Company shall be submitted to the Ministry **with six months.** The policy shall specifically address issues of adherence to environmental policy so formulated and environmental clearance conditions stipulated for the power project and also others including matters related to violations of stipulated conditions (if any) to the Board.	Complied
(II)	The treated effluents confirming to the prescribed standards only shall be re-circulated and reused within the plant. Arrangements shall be made that effluents and storm water do not get mixed.	Complied All the Effluents are treated through ETP (Effluent Treatment Plant) to meet the effluent standards and the treated water is used for Green belt development/dust suppression.
(III)	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt / plantation.	Complied.

		Modular STP has been installed treating sewage water and discharging for green belt development.
(IV)	A well-designed rainwater harvesting shall be constructed. Central Groundwater Authority / Board shall be consulted for finalization of appropriate rainwater harvesting technology within **a period of three months** from the date of issue of clearance and details shall be furnished to the Regional Office of the Ministry.	Three Numbers of Rainwater harvesting ponds are constructed to harvest rainwater. Photos enclosed as **Annexure-IV**.
(V)	Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Copy of these measures with full details along with location plant layout shall be submitted to the Ministry as well as to the Regional Office of the Ministry.	Complied Adequate safety measures like fire hydrant, fire extinguishers, smoke detectors, hose reel, hose house, water monitor, D.V system, Fire water pump house, fire tenders are available to prevent from spontaneous fires.
(VI)	Storage facilities for auxiliary liquid fuel such as LDO and HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil.	Storage facilities in the plant for auxiliary liquid fuel are provided and the facilities are approved by Department of Explosives, Nagpur. Liquid fuel is procured from Oil Companies (GOI Undertakings) and Sulphur content condition is complied with. Environment and disaster preparedness plan is in place and approved by Inspector of Factories and Boilers.
(VII)	Regular monitoring of ground water level shall be carried out by establishing a network of existing wells and constructing new piezometers. Monitoring around the ash pond area shall be carried out particularly for heavy metals (Hg, Cr, As, Pb) and records maintained and submitted to the Regional Office of this Ministry. The data so obtained should be compared with the baseline data so as to ensure that the ground water quality is not adversely affected due to the project.	Complied Regular monitoring is being carried in existing wells and test wells constructed around ash pond area and reports are submitted monthly to KSPCB office and the same is submitted to RO-MoEF&CC once in six months. Monitoring reports are enclosed as **Annexure-I**. The compared baseline data for the period of September'2023 for water quality and ambient air quality is enclosed as **Annexure-VII**
(VIII)	Monitoring surface water quantity and quality shall also be regularly	Complied

	conducted and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall be undertaken.	Surface water monitoring is carried regularly in the monitoring points finalized in consultation with KSPCB. Monitoring reports are submitted regularly to RO-KSPCB and same is submitted to RO-MoEF&CC once in six months. Monitoring reports for the period of April'2023 to September'2023 is enclosed as **Annexure-I**. However, surface water Quantity measurement is not applicable.
(IX)	First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase	Complied All the arrangements are made during the construction phase.
(X)	Noise levels emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 75 dBA. For people working in the high noise area, requisite personal protective equipment like earplugs / ear muffs etc. shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non-noisy / noise less areas.	Complied Enclosures are provided for turbines to control the noise. The persons working in the high noise area are provided with ear plugs/earmuffs. All the employees working in the area are examined periodically for audiometric and records are maintained.
(XI)	Regular monitoring of ground level concentration of SO_2, NO_x, $PM_{2.5}$ & PM_{10} and Hg shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.	Complied Regular monitoring is carried as per NAAQ standards in all the locations finalized by KSPCB. Ambient Air Quality Monitoring stations are established in the plant for continuous monitoring of pollution levels. Monitoring reports are regularly submitted to KSPCB and RO-MoEF&CC and copy of the report along with the data is being kept on company website in six monthly compliance reports http://www.adanipower.com/downloads
(XII)	Provision shall be made for the housing of construction labor (as applicable) within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The	Complied All the arrangements are made during the construction phase.

	housing may be in the form of temporary structures to be removed after the completion of the project	
(XIII)	The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter	Complied
(XIV)	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions / representations, if any, received while processing the proposal. The clearance letter shall also be put on the website of the Company by the project proponent.	Complied Clearance letter is displayed in company website as part of the Six-monthly compliance report of EC conditions. http://www.adanipower.com/downloads
(XV)	An Environmental Cell shall be created at the project site itself and shall be headed by an officer of appropriate seniority and qualification. It shall be ensured that the head of the Cell shall directly report to the Head of the Organization. The status report on the functioning of the Cell shall be submitted to the regional office of the Ministry periodically. The Cell shall comprise of an expert in Marine Biology, Fishery and Mangroves preservation.	Complied A well-qualified Environment cell is established. Head of the Environment department is directly reporting to station head. Director & Research Karnataka Veterinary, Animal & Fisheries Sciences University Bidar, is a member of Environmental Monitoring committee is providing necessary technical assistance in Marine Biology, Fishery and Mangroves preservation issues.
(XVI)	The proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM ($PM_{2.5}$ & PM_{10}), SO_2, NO_x (ambient levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain.	Complied Status of compliance of the stipulated environmental clearance conditions including results of monitored data is kept website and is being update on Six monthly bases. http://www.adanipower.com/downloads Monitoring parameters are displayed near main gate. Online Continuous emission monitoring (CEMS) data is supplied to CPCB and displayed in the public domain through the below said website. URL: http://cpcbrtdms.nic.in/ Regularly monitoring data is submitted to Regional Office of MoEF&CC, Regional Office of KSPCB and Zonal Office of CPCB.

(XVII)	The environment statement for each financial year ending 31st March in Form – V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.	Complied Copy of Environmental statement for the Financial Year 2022-23 is submitted to RO-MoEF&CC and RO-KSPCB. Copy is enclosed as **Annexure-VIII** . The copy of Environmental statement is kept in six monthly EC compliance report to MoEF&CC. Six monthly report is displayed through company website. http://www.adanipower.com/downloads
(XVIII)	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of the environment of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional Office, Ministry of Environment and Forests	Complied Six monthly compliance reports are regularly submitted to Regional Office of MoEF&CC, Regional Office of KSPCB and Zonal Office of CPCB. Last Compliance report for the period of October'2022 to March'2023 submitted vide letter no. APL/UPCL/P-I/ENV/EC/MoEFCC /216/05/23 dated 27/05/2023. The same is displayed in the company website. http://www.adanipower.com/downloads
(XIX)	Regional Office of the Ministry of Environment & Forests will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring. Project proponent will up-load the compliance status in their website and up-date the same from time to time at least six monthly basis. Criteria pollutants levels including NOx (from stack & ambient air) shall be displayed at the main gate of the power plant.	Noted. Complied. Complete set of documents including EIA/EMP report was submitted to MoEF&CC and KSPCB for project approval. Status of compliance of the stipulated environmental clearance conditions including results of monitored data is kept on website and is being updated on Six monthly basis. http://www.adanipower.com/downloads Environmental Monitoring parameters are being displayed near the main gate.

<table>
<tr><td>(XX)</td><td>Separate funds shall be allocated for implantation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.</td><td>Complied.
Funds for Environmental protection measures were earmarked at the time of project as per EIA report and measures have been implemented.
Yearly environmental budget is part of the yearly operating cost of the project.
The total Environment Expenditure for the period of April'2023 to September'2023 included the following:
<table>
<tr><th>S.No</th><th>Detail Description</th><th>Amount (Rs.)</th></tr>
<tr><td>1</td><td>Afforestation</td><td>5357668</td></tr>
<tr><td>2</td><td>Environment Monitoring</td><td>2223389</td></tr>
<tr><td>3</td><td>Environment Management</td><td>22438658</td></tr>
<tr><td></td><td>Total</td><td>30019715</td></tr>
</table></td></tr>
<tr><td>(XXI)</td><td>The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of plant</td><td>Complied</td></tr>
<tr><td>(XXII)</td><td>Full cooperation shall be extended to the Scientists/ Officers from the Ministry/ Regional Office of the Ministry at Bangalore/ CPCB/ SPCB who would be monitoring the compliance of environmental status</td><td>Noted & Compliance assured</td></tr>
<tr><td>(5)</td><td>The Ministry of Environment and Forests reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry. The Ministry may also impose additional environmental conditions or modify the existing ones, if necessary.</td><td>Noted</td></tr>
<tr><td>(6)</td><td>Concealing factual data or submission of false / fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986</td><td>Noted</td></tr>
<tr><td>(7)</td><td>In case of any deviation or alteration in the project a fresh reference should be</td><td>Noted.</td></tr>
</table>

	made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required.	
(8)	The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and rules there under, Hazardous Wastes (Management and Handling) Rules, 2008 and its amendments, the Public Liability Insurance Act, 1991 and its amendments.	Noted

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Compliance Status on CRZ Clearance of Sea Water Pipeline 1200 (2×600) MW Coal Based Thermal Power Plant CRZ CLEARANCE NO. 11-14/2010-IA-III dated 18.05.2010

Sl. No.	Conditions	Compliance Status
5	**Specific Conditions**	
I	**Construction phase:**	
(I)	All the conditions stipulated by the Karnataka State Coastal Zone Management Authority vide letter No. FEE 25 CRZ 2009, dated 16.02.2010 and the commitments/ details submitted to KSCZMA shall be strictly complied with.	Condition is noted & complied.
(II)	Regular monitoring shall be carried out before discharging into sea.	Complied. All the used water is directed to Guard Pond and regular monitoring is done and reports are submitted on monthly basis to KSPCB also.
(III)	A joint meeting of both the monitoring groups every year shall be carried out and send the report to MoEF&CC.	Complied with. Regular joint meeting of UPCL monitoring team and third party MoEF&CC and NABL approved lab is conducted and monitoring reports are submitted to MoEF&CC on six monthly basis.
(IV)	It should be ensured that there shall not be any disturbance to fishing activity.	Condition is noted & complied.
(V)	All safety precautionary measures viz. stability of the pipeline, signal for fishing boats etc. shall be installed.	Complied. Sea water Pipeline is in fenced area and Emergency contact number is displayed in critical areas like Road Crossing, Village areas. 3 No's of Safety buoys are provided in the underwater pipeline area for safety of fishing boats.
(VI)	There shall be display boards at critical locations along the pipeline giving emergency instructions. Emergency information board shall contain emergency instructions in additions to contact details	Complied. Sea water Pipeline is in fenced area and caution boards provided with Emergency contact number is displayed in critical areas like Road Crossing, Village areas. Photos of display boards are enclosed as **Annexure-IX**
(VII)	The project shall be implemented in such a manner that there is no damage to the mangroves/other sensitive coastal ecosystems	The pipeline area does not include any mangroves/other sensitive coastal eco systems.
(VIII)	A continuous and comprehensive post-project marine quality monitoring programme shall be taken up. This shall include monitoring of water quality, sediment quality and biological	Complied. Monitoring is carried for sea water quality at intake and outfall points by Fisheries college, Mangalore.

	characteristics and the report shall be submitted every six month to Ministry's Regional Office at Bangalore.	Monitoring Reports for the period of April'2023 to September'2023 is enclosed as **Annexure-I.**
(IX)	It shall be ensured that there is no displacement of people and the houses as a result of the project.	Condition is noted & complied.
(X)	There shall be no withdrawal of ground water in CRZ area, for the project.	Condition is noted & complied.
(XI)	Provision shall be made for the housing of construction labor within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	All the arrangements were made during the construction phase.
(XII)	A First Aid Room will be provided in the project both during construction and operation of the project	Complied with. All the arrangements were made during the construction phase.
(XIII)	Soil and ground water samples will be tested to ascertain that there is no threat to ground water quality	Complied with. All the construction activities are completed.
(XIV)	Any hazardous waste generated during construction phase, should be disposed off as per applicable rules and norms with necessary approvals of the KSPCB.	Complied with. No hazardous waste was generated during construction phase.
(XV)	The diesel generator sets to be used during construction phase should be low Sulphur diesel type and should confirm to Environment (Protection) Rules prescribed for air and noise emission standards.	Construction work involves only excavation and pipe laying work, so DG sets were not used.
(XVI)	The diesel required for operating DG sets shall be stored in underground tanks and if required, clearance from Chief Controller of Explosives shall be taken.	Construction work involves only excavation and pipe laying work, so DG sets were not used.
(XVII)	Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should confirm to applicable air and noise emission standards and should be operated only during non-peak hours.	Complied with condition.
(XVIII)	Ambient noise levels should confirm to residential standards both during	Condition is noted & complied.

	day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase. Adequate measures should be made to reduce ambient air and noise level during construction phase, so as to confirm to the stipulated standards by CPCB/KSPCB	
(XIX)	Storm water control and its re-use as per CGWB and BIS standards for various applications.	Work involved only in lying of pipeline underground and back filling.
(XX)	Regular supervision of the above and other measures for monitoring should be in place all through the construction phase, so as to avoid disturbance to the surroundings	Condition is noted & complied.
(II)	**OPERATION PHASE**	
(I)	Noise should be controlled to ensure that it does not exceed the prescribed standards. During night time the noise levels measured shall be restricted to the permissible levels to comply with the prevalent regulations	Not applicable in the area because no structure is available in the area.
(II)	The green belt of the adequate width and density preferably with local species along the periphery of the power plant shall be raised so as to provide protection against particulates and noise as suggested by KSCZMA.	Complied. Green belt is developed in the power plant area in accordance with environmental clearance.
(III)	Project proponent shall support afforestation activities by way of raising and supply of required seedling by the locals within 5KM radius of the plant as suggested by KSCZMA	Condition is noted & complied.
(IV)	The ground water level and its quality should be monitored regularly	The work involves only laying of pipeline and no other industrial activities are involved. However regular water monitoring is being carried in the test wells constructed in the pipeline area. Monitoring reports for the period of April'2023 to September'2023 is enclosed as **Annexure-I.**
(V)	The mangroves, if any, on the site should not be disturbed in anyway	Complied with at the time of pipeline construction.
(VI)	The environmental safeguards contained in the application should be implemented in letter and spirit	Complied with.

<table>
<tr><td>(VII)</td><td>A separate Environment management Cell with suitably qualified staff to carry out various environment related functions shall be set up under the charge of a Senior Executive who will report directly to the Chief Executive of the Company.</td><td>Complied.
Well qualified environment cell is established which is headed by HOD-Environment who is directly reporting to station head.</td></tr>
<tr><td>(VIII)</td><td>The funds earmarked for environment protection measures shall be maintained in a separate account and there shall be no diversion of these funds for any purpose. A year wise expenditure on environmental safeguards shall be reported to this Ministry's Regional Office at Bangalore.</td><td>Noted and Complied.
Funds for Environmental protection measures were earmarked at the time of project as per EIA report and measures have been implemented.

Yearly environmental budget is part of the yearly operating cost of the project.

The Environment Expenditure for the period of April'2023 to September'2023 included the following:
<table>
<tr><th>S.No</th><th>Detail Description</th><th>Amount (Rs.)</th></tr>
<tr><td>1</td><td>Afforestation</td><td>5357668</td></tr>
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<tr><td>3</td><td>General Environment Management</td><td>22438658</td></tr>
<tr><td>4</td><td>Total</td><td>30019715</td></tr>
</table></td></tr>
<tr><td>(IX)</td><td>In case of deviation or alteration in the project including the implementing agency, a fresh reference shall be made to this Ministry for modification in the clearance conditions or imposition of new one for ensuring environmental protection. The project proponents shall be responsible for implementing the suggested safeguard measures.</td><td>Condition is noted & compliance.</td></tr>
<tr><td>(X)</td><td>This Ministry reserves the right to revoke this clearance, if any of the conditions stipulated are not complied with to the satisfaction of this Ministry</td><td>Condition is noted & compliance.</td></tr>
<tr><td>(6)</td><td colspan="2">GENERAL CONDITIONS</td></tr>
<tr><td>(I)</td><td>Adequate provision for infrastructure facilities including water supply, fuel and sanitation must be ensured for construction workers during the construction</td><td>Complied with.
All the arrangements are made during the construction phase.</td></tr>
</table>

	phase of the project to avoid any damage to the environment.	
(II)	Appropriate measures must be taken while undertaking digging activities to avoid any likely degradation of water quality.	Condition is noted & complied.
(III)	Borrow sites for each quarry sites for road construction material and dump sites must be identified keeping in view the following	Not Applicable since no road construction work involved in the CRZ area.
(a)	No excavation or dumping on private property is carried out without written consent of the owner	Condition is noted & complied.
(b)	No excavation or dumping shall be allowed on wetlands, forest areas or other ecologically valuable or sensitive locations.	Condition is noted & complied.
(c)	Excavation work shall be done in close consultation with the Soil Conservation and Watershed Development Agencies working in the area, and	Condition is noted & complied.
(d)	Construction spoils including bituminous material and other hazardous materials must not be allowed to contaminate water courses and the dump sites for such materials and the dump sites for such materials must be secured so that they shall not leach into the ground water	Condition is noted & complied.
(IV)	Adequate precautions shall be taken during transportation of the construction material so that it does not affect the environment adversely	Complied with. All the precautionary measures are taken during construction time.
(V)	Borrow pits and other scars created during the laying of cable shall be properly leveled and treated	Complied with. Was not applicable.
(VI)	Adequate financial provision must be made in the project to implement the aforesaid safeguards.	Complied with.
(VII)	The project proponent will set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.	Complied. Well qualified Environment cell is established which is headed by HOD-Environment who is directly reporting to Station Head.
(VIII)	Full support shall be extended to the officers of this Ministry/Regional Office at Bangalore by the project proponent during inspection of the	Noted for compliance.

	project for monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities.	
(IX)	MoEF or any other competent authority may stipulate any additional conditions or modify the existing ones, if necessary in the interest of environment and the same shall be complied with.	Noted for compliance.
(X)	The Ministry reserves the right to revoke this clearance if any of the conditions stipulated are not complied with the satisfaction of the Ministry	Noted for compliance.
(XI)	In the event of a change in the project profile or change in the implementation agency, a fresh reference shall be made to the MoEF	Noted for compliance.
(XII)	The project proponents shall inform the Regional office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work	The pipeline activity is a part of the total power project. The date of financial closure for the total project was 13.06.2007. The MOEF&CC clearance was originally received on 20.03.1997 and the clearance for augmented capacity (from 2 x 507.5 to 2 x 600 MW) was received on 09.09.2009. Consolidated Environmental clearance received on 01.09.2011. The land development work for the pipeline activity was commenced in March 2009.
(XIII)	KSPCB shall display a copy of the clearance letter at the Regional Office, District Industries Center and Collector's office/Tahsildar's office for 30 days.	Noted as related to KSPCB.
7	These stipulations would be enforced among others under the provisions of Water Act, 1974, Air Act, 1981, Environment Act, 1986, Public Liability Act, 1991 and EIA Notification 2006, including the amendments and rules made thereafter.	Noted for compliance.
8	All other statutory clearances such as the approvals for storage of diesel from CCE, Fire Department, Civil Aviation Dept, Forest Conservation Act, 1980 and Wild life Act, 1972, etc shall be obtained, as applicable by project proponents from the respective competent authorities.	Noted. These clearances were not applicable for sea water pipeline work.

9	The project proponent shall advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded EC and copies of clearance letters are available with the KSPCB and may also be seen on the website of MoEF at http://www.envfor.nic.in. The advertisement should be made within 10 days from the date of receipt of the Clearance letter and a copy of the same should be forwarded to the Regional Office of this Ministry at Bangalore.	Complied. A copy of advertisement in local newspaper is submitted to RO-MoEF&CC vide ref letter No: UPCL/B04/2010/1990 dated: 29.05.2010.
10	EC is subject to final order of the Honorable Supreme Court of India in the matter of Goa Foundation Vs Union of India in Writ Petition (Civil) No.460 of 2004 as may be applicable to this project.	Noted for compliance.
11	Any appeal against this EC shall lie with National Environment Appellate Authority, if preferred, within a period of 30 days as prescribed under Section 11 of the National Environment Appellate Act, 1997.	Noted for compliance.
12	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.	This is to clarify that the pipeline activity is a part of the main plant for which there was no need for public hearing as mentioned in MOEF&CC letter.113011/23/96-IA-II (T) Part dated 31.01.2005. Hence no representations were received and therefore this clause is not applicable.
13	The proponent shall upload the status of compliance of stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF at Bangalore, the respective Zonal Office of CPCB and the KSPCB. The criteria pollutant levels namely; SPM, RSPM, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters,	Compliance status of the stipulated conditions uploaded on the website. However, results of monitoring data is not applicable since the activity involved is only laying of the water pipeline and no industrial activity involved in the area under discussion (CRZ). The monitoring data of the main plant is uploaded on the website and displayed near the main gate of the project. Reports are displayed in company website. http://www.adanipower.com/downloads

	indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	
14	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and SPCB	Complied Six monthly compliance reports are regularly submitted to Regional Office of MoEF&CC, Regional Office of KSPCB and Zonal Office of CPCB. Last Compliance report for the period of October'2022 to March'2023 submitted vide letter no. APL/UPCL/P-I/ENV/EC/MoEFCC /216/05/23 dated 27/05/2023.
15	The Environmental Statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned KSPCB as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Office of MoEF at Bangalore by email.	Complied with. Copy of Environmental statement for the Financial Year 2022-23 is submitted to RO-MoEF&CC and RO-KSPCB is enclosed as **Annexure-VIII** for reference. The copy of the same is displayed through company website as part of the six-monthly EC compliance report. http://www.adanipower.com/downloads

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F. No J-13012/12/2015-IA.I (T)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

2nd Floor, Vayu Block
Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi-110003

Dated: 26th June, 2023

To,

M/s Adani Power Ltd.
Adani House, Nr Mithakhali Circle
Navrangpura, Ahmedabad – 380 009
Gujarat

Sub: Expansion by addition of 2x800 MW (Phase-II) Imported Coal based Super Critical Thermal Power at Village Yelluru, Taluk Udupi, Distt. Udupi in Karnataka - Transfer of environmental clearance from M/s Udupi Power Corporation Limited to M/s Adani Power Ltd. - reg.

Sir,

This has reference to your online proposal no. IA/KA/THE/297953/2023 dated 25th February, 2023 regarding transfer of the environmental clearance for the above said project from M/s Udupi Power Corporation Limited to M/s Adani Power Ltd.

2. The Ministry had earlier issued environmental clearance for the project 2X500 MW Coal Based Thermal Power Plant at Padubidri in favour of M/s Nagarjuna Power Corporation Ltd vide letter dated 20th March, 1997. Further, the environmental clearance for enhancement of project capacity from 2x507.50 MW to 2x600 MW coal based thermal power plant was granted by the Ministry vide letter dated 9th September, 2009 followed by amendment in EC dated 1st September, 2011. Further, the Ministry granted environmental clearance for expansion by addition of 2x800 MW (Phase-II) Imported Coal based Super Critical Thermal Power vide letter dated 1st August, 2017.

3. M/s Adani Power Ltd has submitted application for transfer of environmental clearance and informed that the Hon'ble NCLT vide its order dated 8.02.2023, sanctioning the scheme of amalgamation of M/s Udupi Power Corporation Limited with M/s Adani Power Ltd, and thus necessitating transfer of all requisite approvals in the name of M/s Adani Power Ltd. Also, it has informed that M/s Udupi Power Corporation Limited is wholly owned subsidiary company of Adani Power Ltd.

4. M/s Adani Power Ltd, has submitted an affidavit to abide by the terms and conditions stipulated in the environment clearance dated 20th March, 1997, 9th September, 2009 followed by amendment in EC dated 1st September, 2011 and environmental clearance dated 1st August, 2017 issued in the name of M/s Udupi Power Corporation Limited.

5. As per the relevant provisions of the EIA Notification, 2006, the environmental clearance granted to the project vide letter dated 20th March, 1997 for 2X500 MW Coal Based Thermal Power Plant and 9th September, 2009 for enhancement of project capacity from 2x507.50 MW to 2x600 MW coal based thermal power plant followed by amendment in EC dated 1st September, 2011 and environmental clearance dated 1st August, 2017 for expansion by addition of 2x800 MW (Phase-II) Imported Coal based Super Critical Thermal Power at Village Yelluru, Taluk Udupi, Distt. Udupi in Karnataka are hereby transferred from M/s Udupi Power Corporation Limited to M/s Adani Power Ltd on the same terms and conditions under which prior environmental clearance was initially granted.

6. This issues with approval of the competent authority.

26.6.2023

(Yogendra Pal Singh)
Scientist 'E'

Copy to: -

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110 001.
2. The Chairman, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi - 110 066.
3. The Member Secretary, Central Pollution Control Board, Parivesh Bhawan, CBD cum-Office Complex, East Arjun Nagar, Delhi – 110 032.
4. The Deputy Director General of Forests (C), Integrated Regional Office Kendriya Sadan, 4th Floor, E&F Wings, 17th Main Road, Koramangala II Block, Bangalore – 560 034.
5. Principal Secretary to Government (Forest), Forest, Environment and Ecology Department, Karnataka Government Secretariat, Room No. 442, 4th Floor, Gate No. 2, M. S. Building, Bangalore – 560 001.
6. The Member Secretary, Karnataka State Pollution Control Board, Parisara Bhavan, #49, Church St, Bengaluru, Karnataka – 560 001.
7. Guard file/Monitoring file.
8. Website of MoEF&CC.

26.6.2023

(Yogendra Pal Singh)
Scientist 'E'

Meteorological Data

Annexure-I

Continuous Meteorological Observatory Station installed at site to observe following parameters: Temperature, Humidity, Wind Speed, Wind Direction and Rainfall.

TABLE-1: AVERAGE DAILY METEOROLOGICAL DATA OF APRIL-2023

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
1/Apr/2023	22.95	32.87	49.55	100.00	0.00
2/Apr/2023	22.67	32.10	59.43	100.00	0.00
3/Apr/2023	23.22	32.58	44.02	99.40	0.00
4/Apr/2023	22.54	32.03	58.40	98.80	0.00
5/Apr/2023	22.60	31.95	60.23	98.50	0.00
6/Apr/2023	22.98	32.15	61.08	100.00	1.90
7/Apr/2023	24.26	33.39	50.10	100.00	0.00
8/Apr/2023	25.26	32.64	68.64	100.00	0.00
9/Apr/2023	24.04	33.11	66.87	100.00	0.00
10/Apr/2023	24.82	33.77	63.16	100.00	0.00
11/Apr/2023	25.93	33.19	71.83	100.00	0.00
12/Apr/2023	25.96	35.00	60.49	97.90	0.00
13/Apr/2023	25.98	33.70	65.63	100.00	0.00
14/Apr/2023	25.85	34.64	61.28	100.00	0.00
15/Apr/2023	26.24	33.69	66.43	100.00	0.00
16/Apr/2023	27.10	34.77	63.63	99.10	0.00
17/Apr/2023	27.14	35.20	59.64	100.00	0.00
18/Apr/2023	27.30	34.75	53.71	99.50	0.00
19/Apr/2023	26.22	34.74	60.23	100.00	0.00
20/Apr/2023	26.03	34.32	66.03	100.00	0.00
21/Apr/2023	26.96	34.34	58.89	98.70	0.00
22/Apr/2023	27.08	34.57	54.37	96.60	0.00
23/Apr/2023	26.18	34.30	61.35	97.50	0.00
24/Apr/2023	24.62	33.70	55.53	99.00	0.00
25/Apr/2023	24.27	33.59	50.77	99.80	0.00
26/Apr/2023	25.45	33.26	61.00	98.70	0.00
27/Apr/2023	25.84	34.17	50.95	96.90	0.00
28/Apr/2023	24.67	35.27	50.56	94.50	0.00
29/Apr/2023	26.25	34.87	48.29	95.50	0.00
30/Apr/2023	27.25	35.14	51.51	93.40	0.00
					1.90

TABLE-2: AVERAGE DAILY METEOROLOGICAL DATA OF MAY-2023

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
1/May/2023	26.13	34.71	40.29	97.80	0.40
2/May/2023	25.96	34.53	48.83	100.00	0.00
3/May/2023	25.44	33.74	50.39	94.10	0.00
4/May/2023	25.20	34.20	48.96	93.40	8.42
5/May/2023	24.88	33.68	52.09	100.00	0.00
6/May/2023	25.18	33.86	52.59	96.30	0.00
7/May/2023	25.95	34.54	50.67	97.00	0.00
8/May/2023	26.44	34.24	47.24	97.50	0.60
9/May/2023	25.21	34.13	64.89	100.00	0.00
10/May/2023	26.46	34.18	67.02	100.00	0.00
11/May/2023	24.71	35.09	62.23	96.20	1.17
12/May/2023	24.72	33.55	63.10	100.00	0.00
13/May/2023	27.51	32.76	73.59	100.00	0.00
14/May/2023	26.56	35.01	48.21	98.40	0.00
15/May/2023	26.61	34.15	54.32	100.00	0.00
16/May/2023	26.20	34.65	55.36	97.60	0.00
17/May/2023	26.80	34.52	58.60	97.30	0.00
18/May/2023	26.91	34.66	59.18	100.00	0.00
19/May/2023	26.70	33.91	64.05	100.00	0.00
20/May/2023	27.00	33.78	64.40	99.10	0.00
21/May/2023	27.38	34.43	60.86	95.90	0.00
22/May/2023	24.85	35.22	47.21	100.00	0.00
23/May/2023	25.57	34.04	59.77	99.80	0.00
24/May/2023	24.87	34.51	61.75	99.80	2.90
25/May/2023	26.23	34.57	55.96	100.00	0.00
26/May/2023	26.21	34.40	54.37	97.00	0.00
27/May/2023	25.85	34.48	57.39	94.30	0.00
28/May/2023	26.40	34.91	51.15	95.10	0.00
29/May/2023	26.78	35.92	48.52	97.20	0.00
30/May/2023	24.08	35.50	47.51	100.00	2.80
31/May/2023	26.88	35.18	58.66	96.50	0.00
					16.29

TABLE-3: AVERAGE DAILY METEOROLOGICAL DATA OF JUNE-2023

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
1/Jun/2023	26.88	32.14	74.09	100.00	10.29
2/Jun/2023	26.58	33.49	65.75	100.00	0.00
3/Jun/2023	27.08	34.51	62.76	100.00	0.00
4/Jun/2023	27.06	34.61	55.02	100.00	0.00
5/Jun/2023	27.53	34.07	60.75	99.40	0.00
6/Jun/2023	26.82	34.27	61.22	98.50	0.00
7/Jun/2023	27.07	34.29	65.06	97.30	9.59
8/Jun/2023	25.09	33.33	61.22	100.00	0.00
9/Jun/2023	26.11	33.33	64.09	100.00	10.06
10/Jun/2023	25.63	31.04	78.94	100.00	19.52
11/Jun/2023	25.18	30.89	80.50	100.00	26.80
12/Jun/2023	25.46	33.73	69.53	100.00	2.32
13/Jun/2023	25.03	32.98	71.39	100.00	41.06
14/Jun/2023	25.01	33.74	69.10	100.00	19.48
15/Jun/2023	25.27	32.29	76.91	100.00	3.16
16/Jun/2023	25.83	32.95	68.31	100.00	0.00
17/Jun/2023	26.25	32.40	71.58	100.00	28.40
18/Jun/2023	24.11	32.05	67.81	100.00	9.03
19/Jun/2023	25.18	32.98	64.29	100.00	1.64
20/Jun/2023	25.32	32.12	63.66	100.00	13.69
21/Jun/2023	24.06	31.00	73.72	100.00	28.43
22/Jun/2023	24.51	31.30	75.10	100.00	2.80
23/Jun/2023	23.53	28.97	84.00	100.00	91.60
24/Jun/2023	23.43	27.66	88.70	100.00	41.21
25/Jun/2023	24.00	29.29	81.20	100.00	49.80
26/Jun/2023	23.71	30.26	74.88	100.00	15.67
27/Jun/2023	23.70	30.51	74.79	100.00	144.23
28/Jun/2023	23.63	30.15	76.41	100.00	24.21
29/Jun/2023	23.26	28.02	85.60	100.00	25.97
30/Jun/2023	23.86	31.15	76.88	100.00	43.28
					662.24

TABLE-4: AVERAGE DAILY METEOROLOGICAL DATA OF JULY-2023

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
1/Jul/2023	23.86	31.15	78.34	100.00	17.21
2/Jul/2023	24.60	31.72	84.90	100.00	96.73
3/Jul/2023	24.66	30.68	94.10	100.00	92.41
4/Jul/2023	23.76	28.70	81.20	100.00	140.84
5/Jul/2023	23.47	28.91	98.80	100.00	185.53
6/Jul/2023	23.08	25.46	96.70	100.00	66.80
7/Jul/2023	23.73	25.17	96.34	100.00	50.77
8/Jul/2023	39.72	29.65	99.30	100.00	55.23
9/Jul/2023	24.18	26.96	83.00	100.00	18.70
10/Jul/2023	24.18	29.60	75.40	100.00	13.69
11/Jul/2023	24.69	31.41	86.50	100.00	21.76
12/Jul/2023	24.77	29.69	83.70	100.00	77.38
13/Jul/2023	24.25	29.90	87.00	100.00	34.39
14/Jul/2023	24.04	28.23	91.60	100.00	38.37
15/Jul/2023	23.82	27.78	85.50	100.00	19.70
16/Jul/2023	23.92	29.86	84.30	100.00	18.20
17/Jul/2023	25.04	29.74	82.70	100.00	5.15
18/Jul/2023	24.87	30.94	78.23	97.30	1.17
19/Jul/2023	26.91	31.19	82.00	100.00	23.86
20/Jul/2023	25.36	30.82	81.30	100.00	1.40
21/Jul/2023	24.66	30.99	84.20	100.00	52.17
22/Jul/2023	24.00	30.09	91.30	100.00	137.22
23/Jul/2023	23.73	28.02	94.90	100.00	78.60
24/Jul/2023	23.41	26.75	94.80	100.00	75.80
25/Jul/2023	23.71	26.91	91.10	100.00	119.08
26/Jul/2023	23.07	27.56	90.20	100.00	39.48
27/Jul/2023	25.18	32.98	90.24	100.00	31.58
28/Jul/2023	39.82	28.19	80.30	100.00	25.79
29/Jul/2023	23.06	29.34	77.70	100.00	28.60
30/Jul/2023	23.45	30.53	79.10	100.00	7.90
31/Jul/2023	24.29	30.43	81.70	100.00	4.74
					1580.25

TABLE-5: AVERAGE DAILY METEOROLOGICAL DATA OF AUGUST-2023

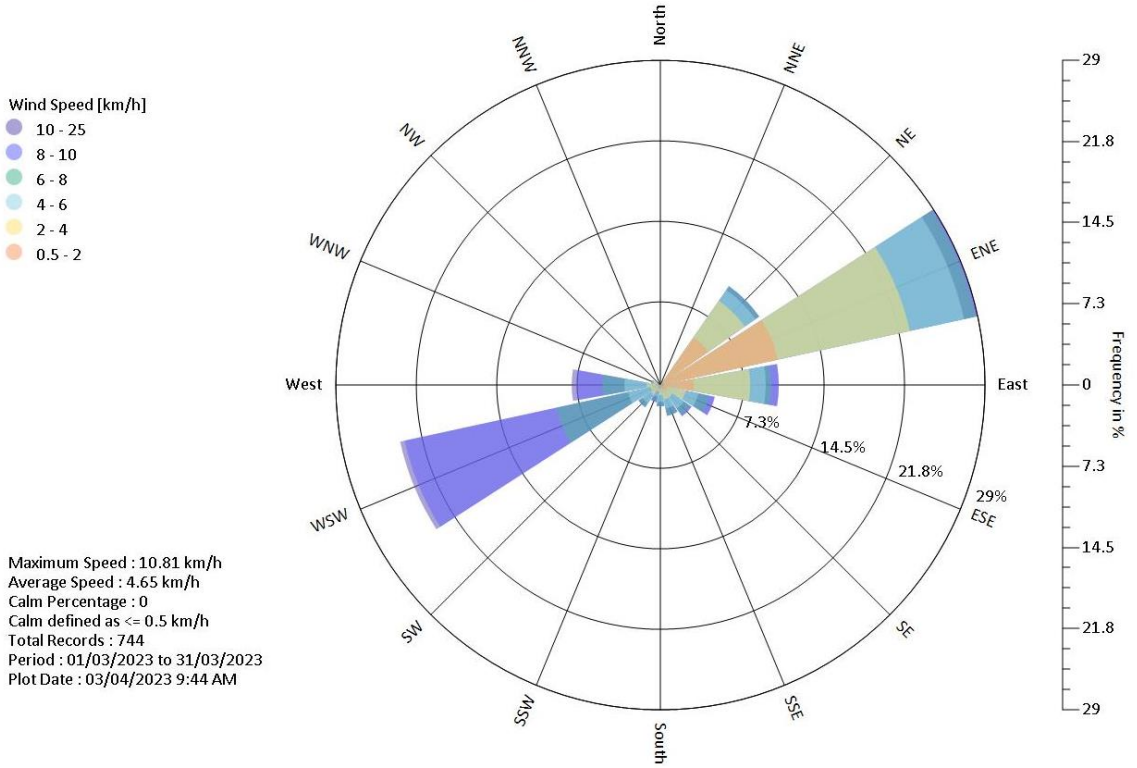
Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
1/Aug/2023	24.60	30.50	81.70	100.00	3.28
2/Aug/2023	24.98	31.11	77.83	100.00	0.00
3/Aug/2023	25.03	30.82	79.73	100.00	7.49
4/Aug/2023	25.66	30.73	81.50	100.00	19.18
5/Aug/2023	24.94	31.24	79.80	100.00	5.10
6/Aug/2023	24.70	31.26	79.94	100.00	3.40
7/Aug/2023	25.02	30.74	80.90	100.00	3.04
8/Aug/2023	24.75	31.08	77.65	100.00	8.95
9/Aug/2023	24.30	30.13	82.60	100.00	0.94
10/Aug/2023	24.32	31.17	73.42	100.00	4.74
11/Aug/2023	25.07	31.78	70.14	100.00	0.00
12/Aug/2023	24.52	31.77	72.11	100.00	0.94
13/Aug/2023	25.44	30.97	75.18	100.00	0.00
14/Aug/2023	25.46	30.57	79.10	100.00	0.00
15/Aug/2023	24.61	30.84	70.11	100.00	0.70
16/Aug/2023	24.24	31.11	64.99	100.00	0.00
17/Aug/2023	24.89	31.68	68.11	100.00	0.00
18/Aug/2023	25.18	31.62	72.28	100.00	24.57
19/Aug/2023	24.32	30.93	77.89	100.00	88.62
20/Aug/2023	23.89	27.15	94.90	100.00	5.20
21/Aug/2023	24.03	30.74	76.57	100.00	0.00
22/Aug/2023	24.29	31.57	72.76	100.00	0.70
23/Aug/2023	24.95	31.83	68.35	100.00	0.00
24/Aug/2023	25.21	31.76	67.24	100.00	0.00
25/Aug/2023	24.53	32.08	68.83	100.00	0.00
26/Aug/2023	24.37	31.11	69.56	100.00	0.00
27/Aug/2023	25.28	31.21	73.79	100.00	0.00
28/Aug/2023	24.84	32.27	68.71	100.00	0.00
29/Aug/2023	24.55	31.50	72.58	100.00	0.00
30/Aug/2023	25.10	32.53	70.09	100.00	0.00
31/Aug/2023	25.32	32.24	68.54	100.00	0.00
					176.85

TABLE-6: AVERAGE DAILY METEOROLOGICAL DATA OF SEPTEMBER-2023

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
1/Sep/2023	25.41	32.58	63.32	100.00	6.84
2/Sep/2023	25.73	32.80	65.88	100.00	0.00
3/Sep/2023	25.61	31.98	68.82	100.00	1.64
4/Sep/2023	25.04	32.10	66.87	100.00	9.12
5/Sep/2023	24.55	31.20	76.71	100.00	25.74
6/Sep/2023	24.37	28.54	86.40	100.00	0.00
7/Sep/2023	24.59	30.61	79.34	100.00	17.78
8/Sep/2023	24.83	31.44	76.51	100.00	26.67
9/Sep/2023	23.69	31.25	77.90	100.00	27.70
10/Sep/2023	23.72	28.61	82.10	100.00	41.32
11/Sep/2023	23.72	30.74	77.48	100.00	12.63
12/Sep/2023	23.46	30.94	76.27	100.00	6.55
13/Sep/2023	24.00	31.75	74.05	100.00	7.49
14/Sep/2023	24.40	31.60	74.17	100.00	6.08
15/Sep/2023	24.53	29.25	83.00	100.00	21.29
16/Sep/2023	24.85	30.66	79.45	100.00	18.00
17/Sep/2023	24.75	29.98	82.90	100.00	11.00
18/Sep/2023	24.96	30.79	79.40	100.00	0.00
19/Sep/2023	24.50	31.60	72.80	100.00	22.93
20/Sep/2023	24.29	31.04	76.76	100.00	6.84
21/Sep/2023	23.58	31.09	73.56	100.00	2.34
22/Sep/2023	24.35	30.92	72.68	100.00	4.20
23/Sep/2023	24.12	31.36	74.91	100.00	71.30
24/Sep/2023	24.86	31.92	71.67	100.00	41.47
25/Sep/2023	23.77	31.50	71.20	100.00	4.74
26/Sep/2023	23.57	31.49	71.74	100.00	4.91
27/Sep/2023	24.90	31.00	73.86	100.00	44.92
28/Sep/2023	24.17	32.28	59.94	100.00	21.06
29/Sep/2023	23.95	29.67	84.50	100.00	18.42
30/Sep/2023	24.63	29.15	88.00	100.00	1.90
					484.88

Wind Rose Month of April - 2023 (01:00 to 24:00)

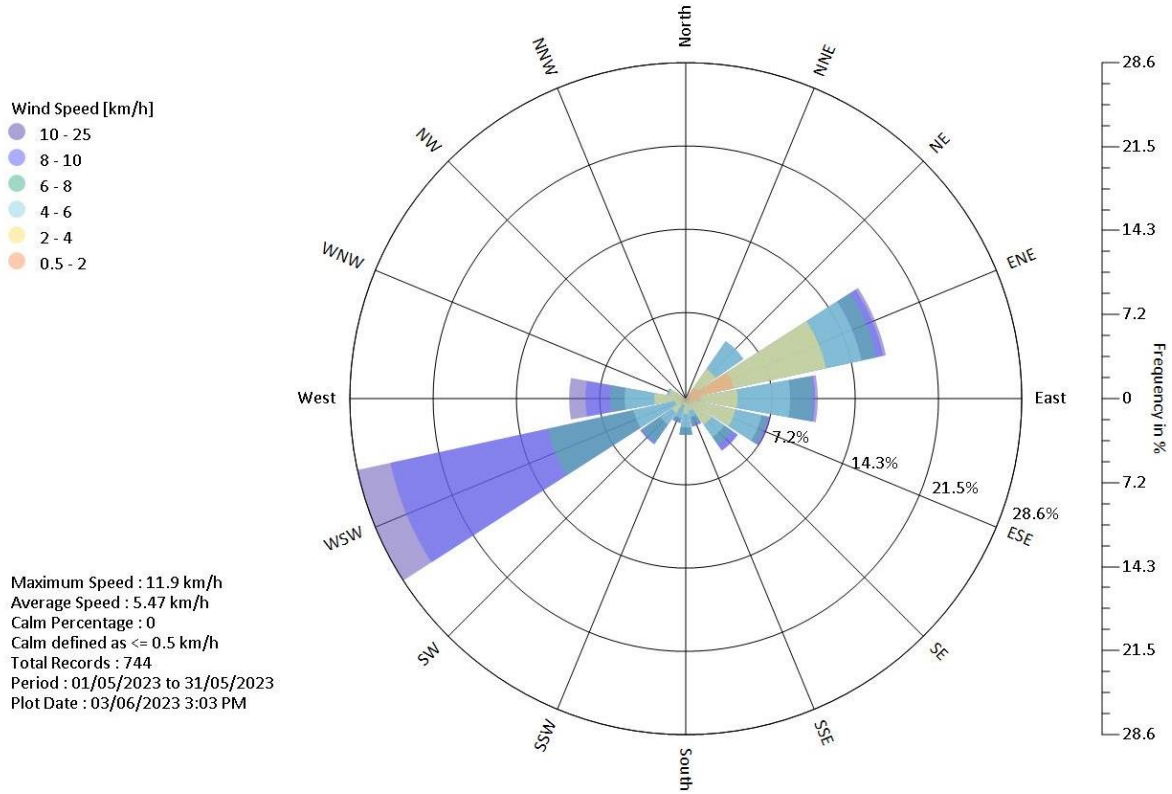
% Frequency of Wind Speed from a Direction



Maximum Speed : 10.81 km/h
Average Speed : 4.65 km/h
Calm Percentage : 0
Calm defined as <= 0.5 km/h
Total Records : 744
Period : 01/03/2023 to 31/03/2023
Plot Date : 03/04/2023 9:44 AM

Wind Rose Month of May- 2023 (01:00 to 24:00)

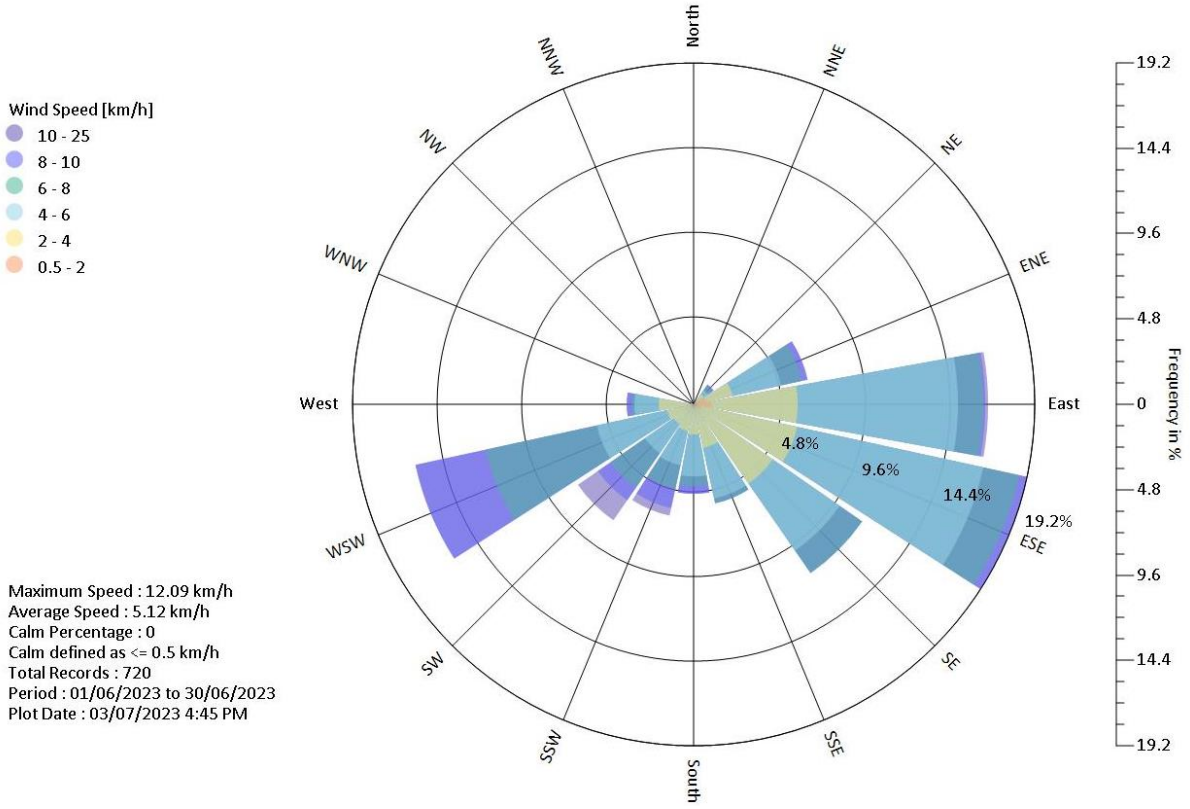
% Frequency of Wind Speed from a Direction



Maximum Speed : 11.9 km/h
Average Speed : 5.47 km/h
Calm Percentage : 0
Calm defined as <= 0.5 km/h
Total Records : 744
Period : 01/05/2023 to 31/05/2023
Plot Date : 03/06/2023 3:03 PM

Wind Rose Month of June-2023 (01:00 to 24:00)

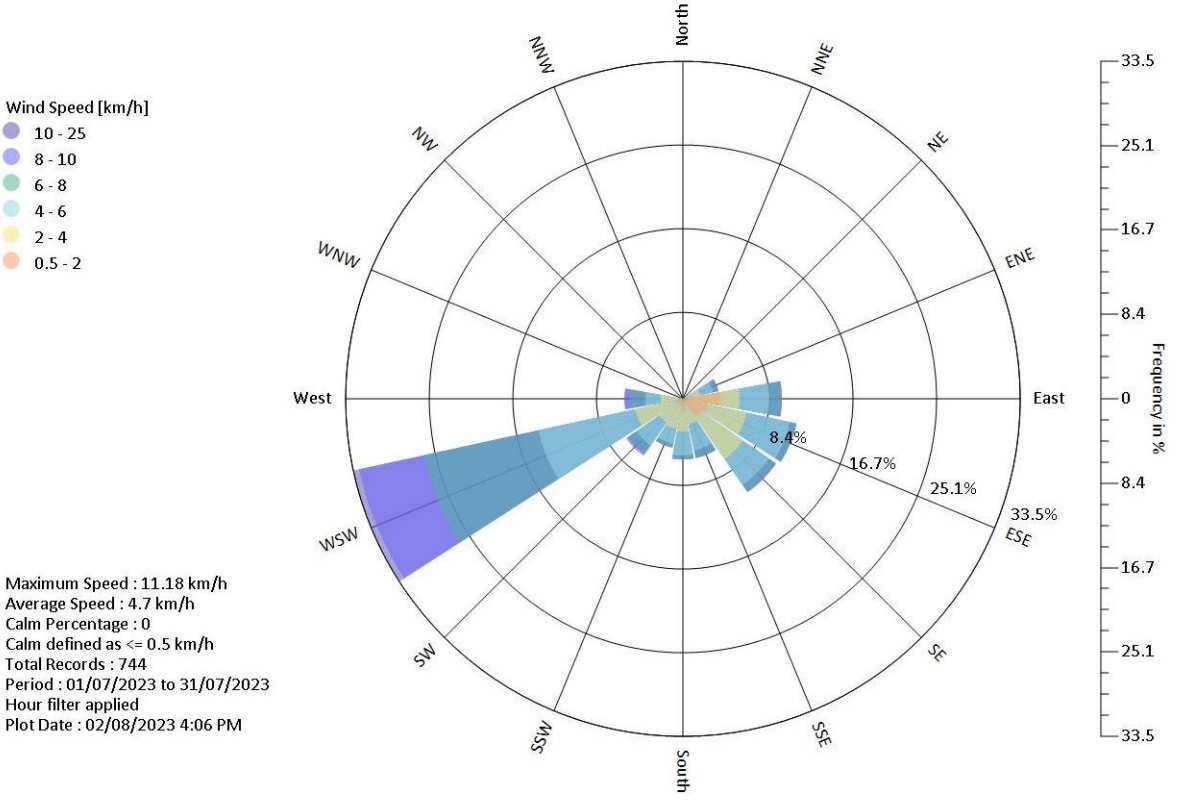
% Frequency of Wind Speed from a Direction



Maximum Speed : 12.09 km/h
Average Speed : 5.12 km/h
Calm Percentage : 0
Calm defined as <= 0.5 km/h
Total Records : 720
Period : 01/06/2023 to 30/06/2023
Plot Date : 03/07/2023 4:45 PM

Wind Rose month of July- 2023 (01:00 to 24:00)

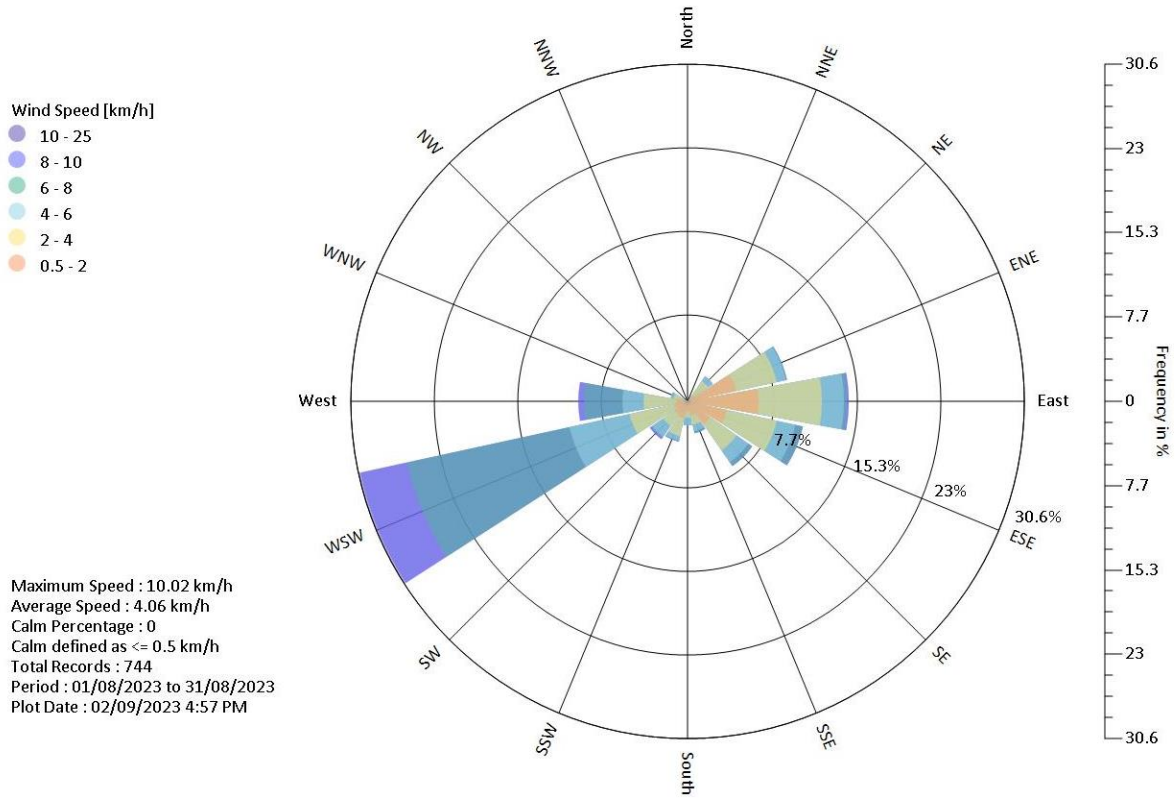
% Frequency of Wind Speed from a Direction



Maximum Speed : 11.18 km/h
Average Speed : 4.7 km/h
Calm Percentage : 0
Calm defined as <= 0.5 km/h
Total Records : 744
Period : 01/07/2023 to 31/07/2023
Hour filter applied
Plot Date : 02/08/2023 4:06 PM

Wind Rose Month of August-2023 (01:00 to 24:00)

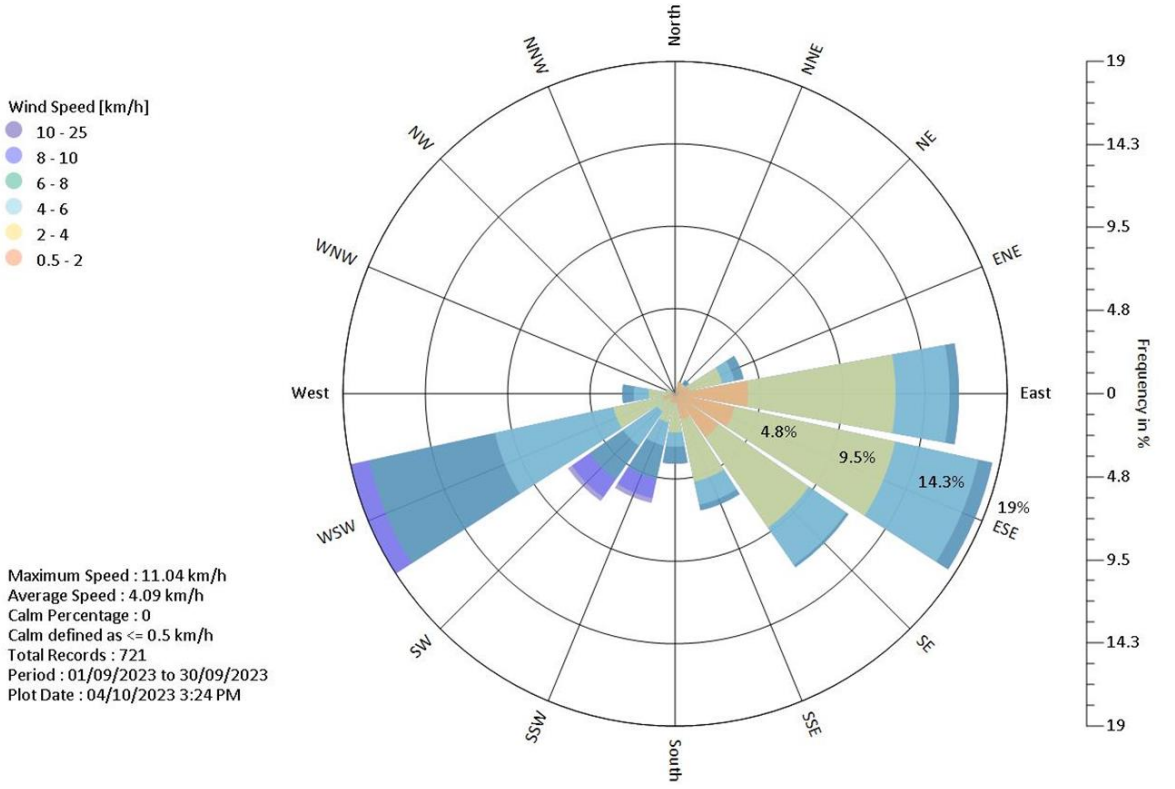
% Frequency of Wind Speed from a Direction



Maximum Speed : 10.02 km/h
Average Speed : 4.06 km/h
Calm Percentage : 0
Calm defined as <= 0.5 km/h
Total Records : 744
Period : 01/08/2023 to 31/08/2023
Plot Date : 02/09/2023 4:57 PM

Wind Rose Month of September-2023 (01:00 to 24:00)

% Frequency of Wind Speed from a Direction



Maximum Speed : 11.04 km/h
Average Speed : 4.09 km/h
Calm Percentage : 0
Calm defined as <= 0.5 km/h
Total Records : 721
Period : 01/09/2023 to 30/09/2023
Plot Date : 04/10/2023 3:24 PM

AMBIENT AIR QUALITY MONITORING

Annexure-I

Table-1: Ambient Air Quality Monitoring in Plant Site (Near DM Plant) for the period of April 2023 to Sep 2023

Location	Month	PM_{10} (100 µg/m³)			$PM_{2.5}$ (60 µg/m³)			SO_2 (80 µg/m³)			NO_x (80 µg/m³)			CO (2.0 mg/m³)		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Near DM Plant (A1)	APR 2023	74.5	86.9	82.4	46.9	49.5	48.5	12.2	13.1	12.7	13.8	14.9	14.3	BLQ	BLQ	BLQ
	MAY 2023	76.7	87.8	84.4	48.6	51.4	50.0	12.6	13.4	13.0	14.2	15.2	14.7	BLQ	BLQ	BLQ
	JUNE 2023	71.6	83.6	78.3	39.6	48.4	44.8	12.3	13.7	12.8	14.0	14.9	14.4	BLQ	BLQ	BLQ
	JULY 2023	41.4	44.4	43.2	21.7	23.3	22.6	11.3	12.6	11.8	13.1	13.7	13.4	BLQ	BLQ	BLQ
	AUG 2023	43.3	46.5	45.1	23.8	25.6	24.8	11.6	13.1	12.2	13.5	15.5	14.0	BLQ	BLQ	BLQ
	SEP 2023	46.2	48.1	47.2	25.5	27.4	26.7	11.9	13.5	12.6	13.8	14.6	14.2	BLQ	BLQ	BLQ

Table-2: Ambient Air Quality Monitoring at Admar village for the period of April 2023 to Sep 2023

Location	Month	PM_{10} (100 µg/m³)			$PM_{2.5}$ (60 µg/m³)			SO_2 (80 µg/m³)			NO_x (80 µg/m³)			CO (2.0 mg/m³)		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Near Admar Village (A2)	APR 2023	58.4	59.8	59.1	37.4	38.3	37.7	11.6	12.3	12.0	13.6	14.2	13.9	BLQ	BLQ	BLQ
	MAY 2023	60.2	62.3	61.1	38.7	40.2	39.6	11.9	12.8	12.4	13.9	14.6	14.2	BLQ	BLQ	BLQ
	JUNE 2023	55.3	60.3	58.6	35.4	39.9	38.7	12.1	12.9	12.5	13.4	14.8	14.2	BLQ	BLQ	BLQ
	JULY 2023	38.1	39.8	39.1	21.7	22.8	22.2	11.1	11.8	11.5	12.1	13.8	12.9	BLQ	BLQ	BLQ
	AUG 2023	40.2	41.8	41.2	23.3	24.6	23.9	11.4	12.2	11.7	12.5	14.3	13.4	BLQ	BLQ	BLQ
	SEP 2023	43.1	43.9	43.4	25.3	26.3	25.8	11.9	12.6	12.1	12.8	14.6	13.6	BLQ	BLQ	BLQ

Table-3: Ambient Air Quality Monitoring at Inna village for the period of April 2023 to Sep 2023

Location	Month	PM_{10} (100 µg/m³)			$PM_{2.5}$ (60 µg/m³)			SO_2 (80 µg/m³)			NO_x (80 µg/m³)			CO (2.0 mg/m³)		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Near Inna Village (A3)	APR 2023	55.2	57.4	56.4	37.5	38.8	38.3	13.3	14.2	13.7	14.2	15.4	14.8	BLQ	BLQ	BLQ
	MAY 2023	57.4	59.6	58.4	39.5	40.7	40.2	13.6	14.4	14.0	14.5	15.7	15.1	BLQ	BLQ	BLQ
	JUNE 2023	54.5	59.8	57.9	34.6	40.9	39.2	13.2	14.6	13.9	14.1	15.8	14.7	BLQ	BLQ	BLQ
	JULY 2023	34.4	38.3	37.0	18.4	20.9	20.2	11.4	12.9	12.4	13.1	14.8	13.8	BLQ	BLQ	BLQ
	AUG 2023	36.6	40.7	39.1	20.7	22.6	22.0	12.4	13.5	13.0	14.1	15.3	14.6	BLQ	BLQ	BLQ
	SEP 2023	39.6	43.5	42.1	23.2	24.4	23.8	12.8	13.8	13.3	14.5	15.8	15.1	BLQ	BLQ	BLQ

[BLQ-Below Limit of Quantification]

Table-4: Ambient Air Quality Monitoring at Hejmady Village for the period of April 2023 to Sep 2023

Location	Month	PM_{10} (100 µg/m³)			$PM_{2.5}$ (60 µg/m³)			SO_2 (80 µg/m³)			NO_x (80 µg/m³)			CO (2.0 mg/m³)		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Near Hejamady Village (A4)	APR 2023	53.4	54.8	54.2	37.2	39.6	38.5	13.2	13.9	13.6	15.3	16.0	15.8	BLQ	BLQ	BLQ
	MAY 2023	55.2	56.7	55.8	39.6	41.2	40.3	13.5	14.1	13.9	15.6	16.4	16.1	BLQ	BLQ	BLQ
	JUNE 2023	49.6	55.6	53.5	35.6	40.4	39.1	12.4	14.2	13.4	14.9	15.9	15.4	BLQ	BLQ	BLQ
	JULY 2023	32.4	35.6	34.4	23.9	25.6	25.0	11.0	12.1	11.7	14.2	14.9	14.6	BLQ	BLQ	BLQ
	AUG 2023	34.6	37.8	36.2	25.5	26.8	26.2	11.5	12.5	12.1	14.2	15.5	14.9	BLQ	BLQ	BLQ
	SEP 2023	36.6	40.1	38.7	27.4	28.8	28.1	11.9	12.8	12.5	15.0	15.8	15.4	BLQ	BLQ	BLQ

Table-5: Ambient Air Quality Monitoring at Baikampady Village for the period of April 2023 to Sep 2023

Location	Month	PM_{10} (100 µg/m³)			$PM_{2.5}$ (60 µg/m³)			SO_2 (80 µg/m³)			NO_x (80 µg/m³)			CO (2.0 mg/m³)		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Near Baikampady Village (A5)	APR 2023	65.4	66.7	65.9	40.5	41.5	40.8	17.6	18.9	18.3	23.8	24.7	24.2	BLQ	BLQ	BLQ
	MAY 2023	66.2	67.5	67.0	41.1	42.1	41.4	17.9	19.2	18.6	24.2	24.9	24.5	BLQ	BLQ	BLQ
	JUNE 2023	61.2	66.7	64.8	36.2	41.5	40.2	18.0	18.9	18.4	23.9	24.8	24.4	BLQ	BLQ	BLQ
	JULY 2023	40.2	40.8	40.5	20.3	21.6	21.0	16.1	16.9	16.5	22.1	22.8	22.5	BLQ	BLQ	BLQ
	AUG 2023	41.8	42.8	42.4	21.4	22.8	22.1	16.5	17.4	17.0	22.4	23.2	22.8	BLQ	BLQ	BLQ
	SEP 2023	44.2	44.9	44.5	23.3	24.6	24.1	16.8	17.6	17.2	23.1	23.7	23.4	BLQ	BLQ	BLQ

Table-6: Ambient Air Quality Monitoring at Paradka Village for the period of April 2023 to Sep 2023

Location	Month	PM_{10} (100 µg/m³)			$PM_{2.5}$ (60 µg/m³)			SO_2 (80 µg/m³)			NO_x (80 µg/m³)			CO (2.0 mg/m³)		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Near Paradka Village (A6)	APR 2023	51.2	52.4	51.8	35.6	37.8	36.7	12.9	13.8	13.5	15.1	15.7	15.4	BLQ	BLQ	BLQ
	MAY 2023	52.3	53.4	52.7	36.5	38.5	37.5	13.2	14.2	13.7	15.4	15.9	15.7	BLQ	BLQ	BLQ
	JUNE 2023	45.2	53.5	50.5	31.2	36.8	35.4	13.1	13.8	13.4	15.1	15.6	15.4	BLQ	BLQ	BLQ
	JULY 2023	31.2	37.6	32.9	15.3	16.8	16.2	11.1	11.8	11.5	13.1	13.8	13.5	BLQ	BLQ	BLQ
	AUG 2023	34.3	37.1	35.6	15.9	17.1	16.5	11.2	12.2	11.7	13.5	14.1	13.8	BLQ	BLQ	BLQ
	SEP 2023	36.6	37.8	37.3	17.1	18.4	17.9	11.8	12.6	12.1	13.8	14.5	14.2	BLQ	BLQ	BLQ

[BLQ-Below Limit of Quantification]

Table-7: Ambient Air Quality Monitoring at Mudarangadi Village for the period of April 2023 to Sep 2023

Location	Month	PM_{10} (100 µg/m³)			$PM_{2.5}$ (60 µg/m³)			SO_2 (80 µg/m³)			NO_x (80 µg/m³)			CO (2.0 mg/m³)		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Near Mudarangadi Village (A7)	APR 2023	58.4	59.8	58.9	36.3	37.1	36.7	13.3	14.5	13.8	15.5	16.6	16.1	BLQ	BLQ	BLQ
	MAY 2023	58.2	60.5	59.3	36.2	38.7	37.8	13.6	14.8	14.1	15.8	16.9	16.3	BLQ	BLQ	BLQ
	JUNE 2023	54.2	60.1	57.9	34.5	38.1	36.4	13.1	13.9	13.5	15.4	16.5	16.0	BLQ	BLQ	BLQ
	JULY 2023	35.1	36.9	35.6	16.1	17.3	16.7	10.1	10.9	10.6	13.3	13.9	13.5	BLQ	BLQ	BLQ
	AUG 2023	36.8	38.1	37.4	16.6	17.9	17.4	10.5	11.6	11.0	13.5	14.2	13.8	BLQ	BLQ	BLQ
	SEP 2023	38.5	40.1	39.4	17.9	19.2	18.6	11.0	11.7	11.4	13.9	14.6	14.3	BLQ	BLQ	BLQ

Table-8: Ambient Air Quality Monitoring at Adani Pump House for the period of April 2023 to Sep 2023

Location	Month	PM_{10} (100 µg/m³)			$PM_{2.5}$ (60 µg/m³)			SO_2 (80 µg/m³)			NO_x (80 µg/m³)			CO (2.0 mg/m³)		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Near Adani Pump House (A8)	APR 2023	54.3	55.8	55.3	36.5	39.1	37.8	13.3	13.9	13.6	15.6	16.3	16.0	BLQ	BLQ	BLQ
	MAY 2023	56.3	56.8	56.6	37.4	40.5	38.9	13.6	14.2	13.9	15.9	16.7	16.3	BLQ	BLQ	BLQ
	JUNE 2023	51.4	56.1	54.6	33.6	38.6	36.5	12.9	13.9	13.5	15.2	16.4	15.9	BLQ	BLQ	BLQ
	JULY 2023	30.5	32.6	31.4	15.1	18.6	17.1	11.3	11.9	11.6	13.3	13.7	13.5	BLQ	BLQ	BLQ
	AUG 2023	32.3	34.5	33.5	17.5	20.9	19.4	11.6	12.6	12.0	13.5	14.2	13.8	BLQ	BLQ	BLQ
	SEP 2023	34.9	36.6	35.5	20.5	22.7	21.9	11.9	12.9	12.4	13.9	14.5	14.2	BLQ	BLQ	BLQ

Table-9: Ambient Air Quality Monitoring at Near Ash Pond for the period of April 2023 to Sep 2023

Location	Month	PM_{10} (100 µg/m³)			$PM_{2.5}$ (60 µg/m³)			SO_2 (80 µg/m³)			NO_x (80 µg/m³)			CO (2.0 mg/m³)		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Near Ash Pond (A9)	APR 2023	52.8	54.9	53.8	41.8	43.9	42.8	13.2	14.5	13.8	14.9	16.3	15.6	BLQ	BLQ	BLQ
	MAY 2023	53.8	56.4	54.9	43.2	45.9	44.0	13.5	14.8	14.2	15.2	16.6	15.9	BLQ	BLQ	BLQ
	JUNE 2023	47.9	55.8	52.9	37.4	44.2	42.2	13.1	14.9	14.1	14.9	16.1	15.6	BLQ	BLQ	BLQ
	JULY 2023	30.2	35.8	33.3	21.5	24.6	23.2	11.1	11.9	11.5	13.0	13.9	13.5	BLQ	BLQ	BLQ
	AUG 2023	32.6	37.1	35.3	23.3	26.6	25.2	11.4	12.4	11.8	13.4	14.4	13.9	BLQ	BLQ	BLQ
	SEP 2023	35.6	39.1	37.4	25.3	28.6	27.0	11.7	12.7	12.2	13.7	14.8	14.2	BLQ	BLQ	BLQ

[BLQ-Below Limit of Quantification]

STACK MONITORING REPORT

Annexure-I

Stack Monitoring has been carried out by NABL accredited laboratory in the frequency of once in fifteen days per month. The monitoring reports for both the units during the period of April 2023 to September 2023 are as Table-1 below.

Table-1: Stack monitoring report for the period of April 2023 to September 2023

Stack	Parameters	Apr-23		May-23	Jun-23		Jul-23	Aug-23		Sep-23	
		07.04.23	27.04.23	30.05.23	06.06.23	19.06.23	05.07.23	11.08.23		12.09.23	27.09.23
Boiler-I	Particulate Matter (mg/Nm³)	45.30	39.80	41.10	SD	37.60	SD	38.40	SD	39.60	SD
	SO2 (mg/Nm³)	500.70	468.40	476.40		458.00		468.60		465.40	
	NOx (mg/Nm³)	168.40	160.50	157.30		156.60		161.30		155.20	
	Mercury mg/Nm³)	BLQ	BLQ	BLQ		BLQ		BLQ		BLQ	
	Flue Gas Velocity (m/s)	24.60	23.30	24.50		24.20		24.00		24.10	
	Flow Rate (Nm³/hr)	2310540.13	2222367.69	2317530.96		2296342.82		2242771.89		2268581.28	
Boiler-II	Particulate Matter (mg/Nm³)	SD	SD	41.80	38.60	39.70	35.60	36.60	37.80	37.70	38.20
	SO2 (mg/Nm³)			482.60	470.30	476.60	421.20	440.80	468.70	447.30	449.30
	NOx (mg/Nm³)			159.50	157.60	159.30	160.60	159.20	161.10	153.90	155.30
	Mercury (mg/Nm³)			BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	Flue Gas Velocity (m/s)			25.90	23.40	26.90	23.80	24.30	25.00	24.60	24.20
	Flow Rate (Nm³/hr)			2378179.71	2220430.66	2470001.32	2317974.77	2236829.39	2289844.13	2298104.50	2255750.90

Note: SD = Shut down, BLQ = Below Limit of Quantification

TEST WELLS MONITORING AROUND ASH POND

ANNEXURE-I

Ash pond is lined with LDPE film of 500 µ thickness as an impervious layer to avoid ground water leachate contamination.

Water samples from Test wells (4 No's) around the ash pond area are analyzed for Ground water monitoring.

Monitoring reports for the period of April 2023 to September 2023 is presented in the Table-1 to Table-4 as below.

The nomenclature for test wells is as below:

1. Test well constructed on North Side of the Ash Pond (13°10'2.46"N 74°49'38.72"E)
2. Test well constructed on South side of the Ash Pond (13°9'48.68"N 74°49'44.85"E)
3. Test well constructed on East Side of the Ash Pond (13°10'5.13"N 74°49'46.98"E)
4. Test well constructed on West Side of the Ash Pond (13°9'51.84"N 74°49'38.56"E)

Table-1: Results of Water Sample from Test Well constructed in North side of Ash Pond sampling period of April 2023 to September 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	April 2023	May 2023	June 2023	July 2023	Aug 2023	Sept 2023
1	Color	Hazen	5	15	1.0	1.0	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.95	6.84	6.88	6.82	6.89	6.76
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	1.4	1.9	1.8	1.5	1.4	1.2
6	TDS	mg/l	500	2000	65.0	60.0	55.2	86.0	59.0	116.0
7	Alkalinity as $CaCO_3$	mg/l	200	600	30.0	32.0	36.0	44.0	22.0	85.0
8	Total Hardness	mg/l	200	600	20.0	30.0	28.5	50.0	14.0	70.0
9	Calcium as Ca	mg/l	75	200	4.00	6.41	7.21	14.43	3.20	12.02
10	Magnesium as Mg	mg/l	30	100	2.43	3.40	5.01	3.42	1.45	9.72
11	Iron as Fe	mg/l	0.3	No relaxation	0.27	0.19	0.18	0.26	0.18	0.21
12	Sulphate as SO_4	mg/l	200	400	6.37	6.42	6.32	4.57	8.68	10.53
13	Chloride as Cl	mg/l	250	1000	18.80	12.86	11.58	9.88	11.88	9.89
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	0.12
20	Arsenic as As	mg/l	0.01	0.05	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	1.42	2.38
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Limit of Quantification

Table-2: Results of Water Sample from Test Well constructed in South side of Ash Pond sampling period of April 2023 to September 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	April 2023	May 2023	June 2023	July 2023	Aug 2023	Sept 2023
1	Color	Hazen	5	15	BLQ	1.0	1.0	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.92	6.88	6.95	6.96	6.86	6.92
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	1.8	1.6	2.0	1.0	1.2	1.3
6	TDS	mg/l	500	2000	110.0	115.0	130.0	84.0	72.0	85.0
7	Alkalinity as $CaCO_3$	mg/l	200	600	76.0	80.0	84.0	42.0	44.0	51.0
8	Total Hardness	mg/l	200	600	74.0	94.0	88.0	50.0	48.0	60.0
9	Calcium as Ca	mg/l	75	200	15.83	20.04	21.64	16.03	2.43	16.83
10	Magnesium as Mg	mg/l	30	100	9.23	10.69	13.62	2.43	1.47	2.37
11	Iron as Fe	mg/l	0.3	No relaxation	0.13	0.24	0.17	0.25	0.23	0.26
12	Sulphate as SO_4	mg/l	200	400	6.21	7.05	9.12	4.75	7.34	8.87
13	Chloride as Cl	mg/l	250	1000	14.84	15.83	19.79	9.89	9.90	7.92
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.01	0.05	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	2.18	BLQ	3.71
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Limit of Quantification

Table-3: Results of Water Sample from Test Well constructed in East side of Ash Pond sampling period of April 2023 to September 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	April 2023	May 2023	June 2023	July 2023	Aug 2023	Sept 2023
1	Color	Hazen	5	15	BLQ	1.0	1.0	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.97	6.76	6.87	6.86	6.94	6.75
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	1.2	1.5	1.2	1.4	BLQ	1.3
6	TDS	mg/l	500	2000	105.0	118.0	125.0	86.0	94.20	86.0
7	Alkalinity as $CaCO_3$	mg/l	200	600	74.0	82.0	80.0	43.0	40.6	54.0
8	Total Hardness	mg/l	200	600	76.0	90.0	92.0	52.0	68.10	62.0
9	Calcium as Ca	mg/l	75	200	13.62	18.43	20.04	15.23	8.09	17.63
10	Magnesium as Mg	mg/l	30	100	7.76	10.69	10.20	3.40	18.27	4.37
11	Iron as Fe	mg/l	0.3	No relaxation	0.09	0.26	0.26	0.27	0.20	0.19
12	Sulphate as SO_4	mg/l	200	400	9.34	5.98	6.14	4.39	9.69	8.62
13	Chloride as Cl	mg/l	250	1000	11.87	17.81	21.77	26.0	17.01	7.92
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	0.28	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.01	0.05	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	2.09	BLQ	2.76
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Limit of Quantification

Table-4: Results of Water Sample from Test Well constructed in West side of Ash Pond sampling period of April 2023 to September 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	April 2023	May 2023	June 2023	July 2023	Aug 2023	Sept 2023
1	Color	Hazen	5	15	BLQ	BLQ	1.0	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.97	6.90	6.92	6.96	6.93	6.81
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	1.5	2.0	2.0	1.4	1.3	1.5
6	TDS	mg/l	500	2000	102.0	110.0	118.0	82.0	30.0	107.0
7	Alkalinity as $CaCO_3$	mg/l	200	600	70.0	80.0	86.0	48.0	8.0	70.0
8	Total Hardness	mg/l	200	600	72.0	84.0	78.0	54.0	9.0	72.0
9	Calcium as Ca	mg/l	75	200	14.42	17.63	13.43	14.43	2.0	20.84
10	Magnesium as Mg	mg/l	30	100	8.74	9.72	7.77	4.37	4.37	4.86
11	Iron as Fe	mg/l	0.3	No relaxation	0.06	BLQ	BLQ	0.26	0.27	0.23
12	Sulphate as SO_4	mg/l	200	400	7.26	6.16	8.14	4.35	5.30	10.39
13	Chloride as Cl	mg/l	250	1000	16.82	14.84	18.80	9.89	9.90	8.91
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.01	0.05	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	2.03	BLQ	2.91
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Limit of Quantification

WATER QUALITY MONITORING REPORT

Annexure-I

Water quality monitoring is carried in the eleven locations which are finalized in consultation with KSPCB and monitoring carried for the period of April'2023 to September'2023 is presented in the Table-1 to Table-11 as below:

Water Quality Sampling Location- Ground/Surface:

S.No	Name of the Location	Code	Source
1	Karnire River near Palimar village	SW-1	River
2	Pangala River Water	SW-2	River
3	Santhoor village	GW-1	Open well
4	Nandikur Village	GW-2	Open well
5	Palimar Village	GW-3	Open well
6	Simanthoor Village	GW-4	Open well
7	Admar Village	GW-5	Open well
8	Bappanadu Village	GW-6	Open well
9	Hejamady Village	GW-7	Open well
10	North Side of the Plant	GW-8	Open well
11	South Side of the plant	GW-9	Open well

Water Sample Analysis Parameters:

S.No	Parameters	S.No	Parameters
1	Color	16	Fluoride
2	pH	17	Phenolic Compounds
3	Odour	18	manganese
4	Taste	19	zinc
5	Turbidity	20	Arsenic
6	TDs	21	cyanide
7	Alkalinity	22	cadmium
8	Total Hardness as $CaCO_3$	23	chromium
9	Calcium as Ca	24	Aluminium
10	Magnesium	25	Selenium
11	Iron	26	Lead
12	Sulphate as SO_4	27	Mercury
13	Chloride	28	Nitrate nitrogen
14	Boron	29	Ecoli
15	Residual Free Chlorine		

The Water Quality test results for the period of April'2023 to September'2023 is presented in the Table-1 to Table-11 as below.

Table-1: Water Quality Monitoring carried out in Karnire River (Back Water) (SW-1) for the period of April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.75	6.76	6.76	6.95	6.85	6.64
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	BLQ	BLQ	1.70	1.80	2.9
6	TDS	mg/l	500	2000	68.00	68.10	72.00	147.00	75.00	88.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	28.00	26.00	30.00	10.00	12.00	10.00
8	Total Hardness	mg/l	200	600	12.00	40.00	42.00	30.00	18.00	24.00
9	Calcium as Ca	mg/l	75	200	4.80	8.01	9.01	5.61	4.81	4.81
10	Magnesium as Mg	mg/l	30	100	2.91	4.86	4.37	3.89	2.40	2.91
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	BLQ	BLQ	0.25	0.24	0.16
12	Sulphate as SO_4	mg/l	200	400	4.34	7.48	8.94	3.35	1.41	9.16
13	Chloride as Cl	mg/l	250	1000	22.76	17.84	16.82	32.35	32.66	33.65
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	0.14
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3.N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	1.12	BLQ	1.08
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Table-2: Water Quality Monitoring carried out in Pangala River (SW-2) for the period April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.98	6.82	7.02	6.86	6.77	6.61
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	1.00	BLQ	1.40	1.50	1.50
6	TDS	mg/l	500	2000	65.00	45.00	48.00	151.00	25.00	28.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	20.00	20.00	18.00	12.00	8.00	10.00
8	Total Hardness	mg/l	200	600	16.00	30.00	32.00	33.00	22.00	9.00
9	Calcium as Ca	mg/l	75	200	6.41	6.50	7.21	5.61	2.02	2.00
10	Magnesium as Mg	mg/l	30	100	3.88	3.40	3.40	4.37	1.46	1.00
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	0.13	BLQ	0.27	0.08	0.27
12	Sulphate as SO_4	mg/l	200	400	5.12	4.32	5.17	17.56	BLQ	1.62
13	Chloride as Cl	mg/l	250	1000	23.75	8.90	10.88	64.33	8.90	6.43
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	1.07	BLQ	1.45
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Table-3: Water Quality Monitoring Carried out at Open well in Santhoor Village (GW-1) for the period of April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.96	6.85	7.01	6.85	6.88	6.83
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	BLQ	BLQ	1.20	BLQ	BLQ
6	TDS	mg/l	500	2000	115.00	80.00	84.00	43.00	29.00	25.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	70.00	20.00	22.00	23.00	11.00	10.00
8	Total Hardness	mg/l	200	600	60.00	36.00	40.00	20.00	10.00	8.00
9	Calcium as Ca	mg/l	75	200	13.62	8.01	8.41	4.81	2.00	1.60
10	Magnesium as Mg	mg/l	30	100	6.31	3.88	4.13	1.94	1.20	1.00
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	BLQ	BLQ	0.09	0.24	BLQ
12	Sulphate as SO_4	mg/l	200	400	8.29	14.12	15.17	4.12	1.34	BLQ
13	Chloride as Cl	mg/l	250	1000	25.74	20.78	21.74	7.91	18.31	6.93
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3.N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	1.34	BLQ	BLQ
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Table-4: Water Quality Monitoring Carried out at Open well in Nandikur Village (GW-2) for the period of April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.88	6.84	7.05	6.77	6.92	6.79
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	1.70	BLQ	BLQ	BLQ	1.50	BLQ
6	TDS	mg/l	500	2000	135.00	65.00	73.00	67.00	56.00	55.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	84.00	24.00	20.00	40.00	33.00	23.00
8	Total Hardness	mg/l	200	600	70.00	30.00	73.00	36.00	38.00	25.00
9	Calcium as Ca	mg/l	75	200	14.42	6.41	7.61	9.62	8.42	5.61
10	Magnesium as Mg	mg/l	30	100	8.26	3.40	3.65	2.91	4.13	2.67
11	Iron as Fe	mg/l	0.3	No relaxation	0.17	BLQ	BLQ	BLQ	0.25	BLQ
12	Sulphate as SO_4	mg/l	200	400	14.12	11.45	6.33	1.89	1.36	3.73
13	Chloride as Cl	mg/l	250	1000	24.74	15.83	16.33	10.89	9.40	10.39
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	1.57	1.99
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Table-5: Water Quality Monitoring carried out at Open well in Palimar Village (GW-3) for the period of April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.93	7.07	7.10	6.86	6.90	7.04
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
6	TDS	mg/l	500	2000	50.00	78.00	78.00	69.00	127.00	143.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	10.00	26.00	66.00	36.00	62.00	65.00
8	Total Hardness	mg/l	200	600	16.00	40.00	46.00	36.00	86.00	105.00
9	Calcium as Ca	mg/l	75	200	3.20	8.01	9.61	8.81	28.86	30.60
10	Magnesium as Mg	mg/l	30	100	1.94	4.86	5.34	3.40	3.40	7.29
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
12	Sulphate as SO_4	mg/l	200	400	2.15	9.18	10.07	2.54	11.89	12.98
13	Chloride as Cl	mg/l	250	1000	21.77	21.90	23.41	11.88	21.80	29.69
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3.N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	2.12	1.73
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Table-6: Water Quality Monitoring carried out at Open well in Simanthoor Village (GW-4) for the period of April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.98	7.05	7.11	6.98	6.92	6.85
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
6	TDS	mg/l	500	2000	52.00	59.80	142.00	64.00	125.00	86.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	10.00	14.00	20.00	36.00	60.00	10.00
8	Total Hardness	mg/l	200	600	12.00	50.00	46.00	34.00	84.00	26.00
9	Calcium as Ca	mg/l	75	200	2.40	14.00	12.82	8.01	28.06	7.21
10	Magnesium as Mg	mg/l	30	100	1.45	5.50	5.34	3.40	3.40	1.94
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	0.23	0.09	BLQ	BLQ	BLQ
12	Sulphate as SO_4	mg/l	200	400	2.06	35.16	30.12	3.65	11.72	8.64
13	Chloride as Cl	mg/l	250	1000	23.75	58.07	52.14	10.39	20.78	19.79
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	0.55	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3.N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	1.75	2.47
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Table-7: Water Quality Monitoring carried out at Open well in Admar Village (GW-5) for the period of April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.86	6.78	6.80	6.75	6.86	6.75
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	BLQ	BLQ	BLQ	1.60	1.30
6	TDS	mg/l	500	2000	85.00	98.00	92.00	35.00	129.00	56.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	60.00	30.00	32.00	12.28	40.00	30.00
8	Total Hardness	mg/l	200	600	54.00	78.00	80.00	10.00	56.00	36.00
9	Calcium as Ca	mg/l	75	200	12.82	22.44	18.43	2.00	14.43	7.61
10	Magnesium as Mg	mg/l	30	100	5.34	5.40	8.26	1.20	4.86	4.13
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	BLQ	BLQ	BLQ	0.25	0.10
12	Sulphate as SO_4	mg/l	200	400	6.35	16.13	14.02	1.67	12.32	7.56
13	Chloride as Cl	mg/l	250	1000	12.86	17.81	19.62	3.46	38.59	6.93
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	3.58	1.47
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Table-8: Water Quality Monitoring carried out at Open well in Bappanadu Village (GW-6) for the period of April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.65	7.37	7.18	6.94	6.78	6.72
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
6	TDS	mg/l	500	2000	55.00	255.00	216.00	65.00	133.00	72.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	22.00	50.00	46.00	38.00	66.00	6.00
8	Total Hardness	mg/l	200	600	12.00	85.00	88.00	34.00	84.00	26.00
9	Calcium as Ca	mg/l	75	200	2.40	18.60	20.04	8.01	27.25	6.41
10	Magnesium as Mg	mg/l	30	100	1.45	7.00	9.23	3.40	3.89	2.43
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	0.26	0.14	BLQ	BLQ	BLQ
12	Sulphate as SO_4	mg/l	200	400	7.46	12.07	16.01	14.90	12.24	7.14
13	Chloride as Cl	mg/l	250	1000	19.79	95.28	91.55	10.89	23.75	15.83
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	0.61	0.38	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3.N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	2.06	3.24
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Table-9: Water Quality Monitoring carried out at Open well in Hejamady Village (GW-7) for the period of April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.96	6.74	6.82	6.81	6.72	6.88
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	BLQ	BLQ	BLQ	1.20	1.20
6	TDS	mg/l	500	2000	60.00	88.00	92.00	67.00	87.00	85.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	26.00	32.00	34.40	38.00	42.00	10.00
8	Total Hardness	mg/l	200	600	14.00	42.00	34.00	36.00	56.00	32.00
9	Calcium as Ca	mg/l	75	200	3.20	9.61	11.22	8.81	17.63	8.02
10	Magnesium as Mg	mg/l	30	100	1.40	4.37	2.91	3.40	2.92	2.92
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	BLQ	BLQ	BLQ	0.22	0.06
12	Sulphate as SO_4	mg/l	200	400	5.12	14.85	16.07	13.61	6.90	24.84
13	Chloride as Cl	mg/l	250	1000	21.77	22.76	24.17	11.88	13.85	18.81
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3.N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	1.99	8.33
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Table-10: Water Quality Monitoring carried out at North Side of UPCL Plant site (GW-8) for the period of April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.94	6.82	6.95	6.79	6.81	6.94
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
6	TDS	mg/l	500	2000	55.00	62.00	70.00	71.00	47.00	54.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	18.00	20.00	22.00	40.00	24.00	22.00
8	Total Hardness	mg/l	200	600	10.00	30.00	34.00	38.00	52.00	24.00
9	Calcium as Ca	mg/l	75	200	4.00	6.41	8.01	9.62	8.02	5.21
10	Magnesium as Mg	mg/l	30	100	2.43	3.40	3.40	3.40	1.46	2.67
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
12	Sulphate as SO_4	mg/l	200	400	4.47	10.18	11.41	3.47	1.08	6.23
13	Chloride as Cl	mg/l	250	1000	19.79	17.81	19.23	12.86	7.91	9.89
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3.N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	0.62	1.12	2.23
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Table-11: Water Quality Monitoring carried out at South Side of UPCL plant site (GW-9) for the period of April 2023 to Sep 2023

S.No	Parameters	Unit	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.94	6.82	6.95	6.79	6.81	6.94
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
6	TDS	mg/l	500	2000	55.00	62.00	70.00	71.00	47.00	54.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	18.00	20.00	22.00	40.00	24.00	22.00
8	Total Hardness	mg/l	200	600	10.00	30.00	34.00	38.00	52.00	24.00
9	Calcium as Ca	mg/l	75	200	4.00	6.41	8.01	9.62	8.02	5.21
10	Magnesium as Mg	mg/l	30	100	2.43	3.40	3.40	3.40	1.46	2.67
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
12	Sulphate as SO_4	mg/l	200	400	4.47	10.18	11.41	3.47	1.08	6.23
13	Chloride as Cl	mg/l	250	1000	19.79	17.81	19.23	12.86	7.91	9.89
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	0.62	1.12	2.23
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

Note: BLQ- Below Level of Quantification

Guard Pond Effluent Water Monitoring

Annexure-I

Samples are collected and the monitoring values for the period of April 2023 to September 2023 are presented in Table as below:

S.N	Parameter	Limit	Unit	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Temperature	Not more than 5°C higher than intake sea water	°C	29.20	29.68	29.92	28.55	29.6	29.90
2	pH (at 25 °C)	5.5 – 9.0	-	7.71	7.57	7.59	7.81	7.70	7.73
3	Colour	-	-	1.0	1.0	1.0	1.0	1.0	1.0
4	Odour	-	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Total Suspended Solids	Not more than 10% higher than intake sea water	mg/l	3.35	3.72	5.20	18.75	3.56	3.38
6	Oil and Grease	20	mg/l	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
7	Total Residual Chlorine	1	mg/l	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
8	BOD	100	mg/l	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
9	COD	250	mg/l	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
10	Total Chromium	2	mg/l	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
11	Hexavalent Chromium	1	mg/l	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
12	Phenolic Compounds	5	mg/l	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
13	Mercury as Hg	0.01	mg/l	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
14	Lead as Pb	2	mg/l	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Arsenic as As	0.2	mg/l	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Iron	3	mg/l	0.23	0.24	0.25	0.26	0.21	0.25

Sea Water Pipeline Test Well Monitoring: Annexure-I

Test Wells are installed in the Sea Water Pipeline fenced area and the monitoring is carried for the period from April 2023 to September 2023 is presented in the Table-1 to Table-6 as below:

The locations of test wells are:

S.NO	Name of the Location	Code	Source
1	Pipeline Corridor test well	PC-1	Test Well
2	Pipeline Corridor test well	PC-2	Test Well
3	Pipeline Corridor test well	PC-3	Test Well
4	Pipeline Corridor test well	PC-4	Test Well
5	Pipeline Corridor test well	PC-5	Test Well
6	Pipeline Corridor test well	PC-6	Test Well

Water Sample Analysis Parameters:

S.No	Parameters	S.No	Parameters
1	Color	16	Fluoride
2	pH	17	Phenolic Compounds
3	Odor	18	manganese
4	Taste	19	zinc
5	Turbidity	20	Arsenic
6	TDs	21	cyanide
7	Alkalinity	22	cadmium
8	Total Hardness as $CaCO_3$	23	chromium
9	Calcium as Ca	24	Aluminium
10	Magnesium	25	Selenium
11	Iron	26	Lead
12	Sulphate as SO_4	27	Mercury
13	Chloride	28	Nitrate nitrogen
14	Boron	29	E.coli
15	Residual Free Chlorine		

Table-1: Pipeline Corridor Test Well (PC-1) for the period of April 2023 to Sep 2023

S.No	PARAMETERS	UNIT	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	7.15	6.85	7.08	6.83	6.72	6.77
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	1.50	2.00	BLQ	0.70	1.80	1.40
6	TDS	mg/l	500	2000	115.00	118.00	130.00	62.00	86.00	93.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	4.00	40.00	44.00	27.00	8.30	8.00
8	Total Hardness	mg/l	200	600	38.00	110.00	98.00	26.00	34.00	30.00
9	Calcium as Ca	mg/l	75	200	5.61	25.10	21.64	5.80	5.60	6.41
10	Magnesium as Mg	mg/l	30	100	5.83	13.08	10.69	2.91	4.86	3.40
11	Iron as Fe	mg/l	0.3	No relaxation	0.11	0.08	BLQ	0.075	0.11	0.10
12	Sulphate as SO_4	mg/l	200	400	11.14	4.15	5.07	2.11	1.28	9.29
13	Chloride as Cl	mg/l	250	1000	55.42	63.31	61.36	9.89	34.64	30.68
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	0.28	BLQ	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.01	0.05	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	5.91	2.64
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

BLQ - Below Limit of Quantification

Table-2: Pipeline Corridor Test Well (PC-2) for the period of April 2023 to Sep 2023

S.No	PARAMETERS	UNIT	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.88	6.92	6.85	6.95	6.75	6.88
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	1.20	1.00	BLQ	0.70	1.60	1.30
6	TDS	mg/l	500	2000	150.00	132.00	178.00	66.00	82.00	102.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	90.00	32.00	36.00	38.00	10.00	20.00
8	Total Hardness	mg/l	200	600	100.00	104.52	106.00	36.00	32.00	90.00
9	Calcium as Ca	mg/l	75	200	24.04	24.08	23.24	9.62	6.41	20.04
10	Magnesium as Mg	mg/l	30	100	9.72	11.87	11.66	2.91	3.88	9.72
11	Iron as Fe	mg/l	0.3	No relaxation	BLQ	0.13	0.08	0.12	0.05	0.20
12	Sulphate as SO_4	mg/l	200	400	10.42	7.46	9.15	3.31	1.27	12.63
13	Chloride as Cl	mg/l	250	1000	29.69	68.10	70.27	11.88	33.65	33.62
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	BLQ	0.32	0.36	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.01	0.05	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	1.29	3.62
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

BLQ - Below Limit of Quantification

Table-3: Pipeline Corridor Test Well (PC-3) for the period of April 2023 to Sep 2023

S.No	PARAMETERS	UNIT	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.82	6.86	6.97	6.83	6.95	6.92
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	1.30	2.00	1.00	0.50	1.10	1.40
6	TDS	mg/l	500	2000	150.00	127.00	151.00	65.00	82.00	152.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	76.00	57.00	62.00	38.00	8.00	BLQ
8	Total Hardness	mg/l	200	600	110.00	110.00	114.00	34.00	32.00	45.00
9	Calcium as Ca	mg/l	75	200	28.09	26.04	24.04	8.81	5.61	12.02
10	Magnesium as Mg	mg/l	30	100	8.17	13.08	13.68	2.91	4.37	3.65
11	Iron as Fe	mg/l	0.3	No relaxation	0.16	0.25	0.10	0.09	0.04	0.08
12	Sulphate as SO_4	mg/l	200	400	14.14	8.43	9.51	2.87	1.36	11.70
13	Chloride as Cl	mg/l	250	1000	23.59	58.36	61.27	12.87	34.64	38.61
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	0.35	0.35	0.32	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.01	0.05	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	1.30	3.84
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

BLQ - Below Limit of Quantification

Table-4: Pipeline Corridor Test Well (PC-4) for the period of April 2023 to Sep 2023

S.No	PARAMETERS	UNIT	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.94	6.71	6.85	6.85	6.84	6.83
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	BLQ	2.20	1.80	0.30	1.70	1.20
6	TDS	mg/l	500	2000	198.00	138.00	150.00	63.00	80.00	65.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	36.00	33.00	38.00	36.00	8.00	30.00
8	Total Hardness	mg/l	200	600	130.00	102.00	96.00	34.00	30.00	46.00
9	Calcium as Ca	mg/l	75	200	24.33	24.10	20.04	8.81	5.61	15.23
10	Magnesium as Mg	mg/l	30	100	8.43	9.16	9.23	2.91	3.89	1.94
11	Iron as Fe	mg/l	0.3	No relaxation	0.22	0.17	0.15	0.05	0.09	0.16
12	Sulphate as SO_4	mg/l	200	400	18.32	9.31	12.08	4.61	1.27	0.16
13	Chloride as Cl	mg/l	250	1000	27.44	53.41	50.47	10.88	34.64	9.48
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	0.37	0.36	0.39	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.01	0.05	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	1.41	1.56
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

A – Agreeable; BLQ – Below Limit of Quantification

Table-5: Pipeline Corridor Test Well (PC-5) for the period of April 2023 to Sep 2023

S.No	PARAMETERS	UNIT	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	1.00	1.00	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.96	6.97	7.02	6.88	6.75	6.82
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	1.30	1.50	BLQ	0.60	1.50	1.30
6	TDS	mg/l	500	2000	158.00	118.00	125.00	58.00	81.00	112.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	31.00	28.00	32.00	32.00	8.00	10.00
8	Total Hardness	mg/l	200	600	120.00	96.00	94.00	34.00	32.00	45.00
9	Calcium as Ca	mg/l	75	200	12.10	24.16	22.44	10.42	5.61	8.02
10	Magnesium as Mg	mg/l	30	100	8.17	9.45	9.23	1.94	4.37	6.07
11	Iron as Fe	mg/l	0.3	No relaxation	0.25	0.23	0.09	0.086	0.17	0.09
12	Sulphate as SO_4	mg/l	200	400	8.14	9.42	11.17	3.97	1.39	BLQ
13	Chloride as Cl	mg/l	250	1000	58.36	57.85	54.43	13.85	34.64	34.50
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	0.42	0.41	0.39	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.01	0.05	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3-N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	1.58	3.42
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

BLQ - Below Limit of Quantification

Table-6: Pipeline Corridor Test Well (PC-6) for the period of April 2023 to Sep 2023

S.No	PARAMETERS	UNIT	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
1	Color	Hazen	5	15	1.00	1.00	BLQ	BLQ	BLQ	BLQ
2	pH	-	6.5 - 8.5	No Relaxation	6.97	6.88	6.95	6.89	6.95	6.72
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1	5	1.80	1.60	1.00	1.20	1.20	1.20
6	TDS	mg/l	500	2000	140.00	125.00	137.00	92.00	80.00	97.00
7	Alkalinity as $CaCO_3$	mg/l	200	600	90.00	33.00	30.00	52.00	8.00	6.00
8	Total Hardness	mg/l	200	600	100.00	83.00	86.00	60.00	32.00	36.00
9	Calcium as Ca	mg/l	75	200	24.08	28.17	20.04	13.62	5.61	8.02
10	Magnesium as Mg	mg/l	30	100	8.25	8.88	9.72	6.31	4.37	5.35
11	Iron as Fe	mg/l	0.3	No relaxation	0.25	0.11	0.09	0.23	0.20	0.05
12	Sulphate as SO_4	mg/l	200	400	9.56	6.17	7.09	5.31	1.46	BLQ
13	Chloride as Cl	mg/l	250	1000	63.31	57.74	51.46	13.85	34.64	41.57
14	Boron as B	mg/l	0.5	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Residual Free Chlorine	mg/l	0.2	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Fluoride as F	mg/l	1	1.5	0.47	0.45	0.42	BLQ	BLQ	BLQ
17	Phenolic Compounds	mg/l	0.001	0.002	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
18	Manganese as Mn	mg/l	0.1	0.3	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19	Zinc as Zn	mg/l	5	15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
20	Arsenic as As	mg/l	0.01	0.05	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
21	Cyanide as CN	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22	Cadmium as Cd	mg/l	0.003	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
23	Chromium as Cr	mg/l	0.05	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24	Aluminium	mg/l	0.03	0.2	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
25	Selenium as Se	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26	Lead as Pb	mg/l	0.01	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27	Mercury as Hg	mg/l	0.001	No relaxation	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
28	Nitrate as NO_3.N	mg/l	45	No relaxation	BLQ	BLQ	BLQ	BLQ	1.4	4.55
29	E.Coli	MPN/ 100 ml	Should Not be Detectable		Absent	Absent	Absent	Absent	Absent	Absent

BLQ - Below Limit of Quantification

Table 1. Data on water quality parameters off Padubidri during April, 2023

Sl. No.	Parameters		1	2	3	4	5	6	7
1	Water Temperature (^{0}C)	S	31.1	30.2	30.1	30.4	31.2	31.0	31.2
		SS	31.0	30.1	30.0	30.9	31.0	30.9	31.6
2	pH	S	7.90	7.80	7.30	7.50	7.20	7.40	7.70
		SS	7.60	7.50	7.40	7.50	7.30	7.10	7.60
3	Salinity (psu)	S	32.50	33.13	33.13	33.13	32.50	31.88	32.50
		SS	31.88	32.50	31.88	33.13	32.50	31.88	32.50
4	Dissolved Oxygen (mg/l)	S	4.80	4.00	4.40	4.80	5.20	4.00	4.80
		SS	4.40	4.80	3.60	4.40	4.80	3.60	4.40
5	BOD_3 at 27^{0}C	S	-	1.32	-	-	1.45	-	1.43
		SS		1.39			1.29		1.48
6	COD (mg/l)	S	-	12	-	-	14	-	12
		SS		11			10		15
7	Transparency (m)		5.10	5.12	5.21	7.00	5.20	4.15	5.30
8	Total Suspended Solids (mg/l)		-	0.34	-	-	0.42	-	0.24
9	Total Dissolved Solids (mg/l)		-	32800	-	-	31500	-	31900
10	Ammonia (µg-at/l)	S	5.533	4.928	3.544	3.631	4.063	5.014	4.236
		SS	4.409	4.063	3.372	3.890	3.544	3.372	3.544
11	Nitrite (µg-at/l)	S	1.452	1.357	1.452	1.642	2.023	2.261	2.071
		SS	0.809	0.571	1.071	0.833	1.000	1.142	1.547
12	Nitrate (µg-at/l)	S	4.141	5.022	4.451	3.998	4.094	3.522	3.189
		SS	0.352	3.903	3.522	3.380	3.213	3.499	3.665
13	Phosphate (µg-at/l)	S	1.768	2.222	2.273	2.424	1.566	3.283	2.727
		SS	1.061	1.566	1.717	2.374	2.273	2.475	2.980
14	Silicate (µg-at/l)	S	12.32	12.45	13.52	14.41	14.48	13.41	12.45
		SS	11.42	13.25	14.12	14.23	13.45	13.12	14.56
15	Oil and Grease (mg/l)	S	BDL	BDL	BDL	BDL	BDL	BDL	BDL

BDL: Below Detectable Level

Table 2. Phytoplankton diversity (no/m^3) and Biomass (mg/m^3) in the coastal waters off Padubidri during April, 2023

Sl. No.	Flora	Depth (m)		
		4	8	12
I	**Diatoms**			
1	*Asterionella*			
	a. *A. japonica*	2400	3420	2140
	b. Others	-	-	-
2	*Bacteriastrum*			
	a. *B. varians*	-	-	-
	b. Others	-	-	-
3	*Biddulphia*			
	a. *Biddulphia regia*	1750	2650	2140
	b. *B.sinensis*	-	-	-
	c. *Biddulphia mobiliensis*	-	3100	4200
	d. Others	3000	2970	3140
4	*Cerataulina*			
	a. *C. perlagica*	1780	1460	2000
	b. Others	-	-	-
5	*Chaetoceros*			
	a. *C. lorenzianus*	2600	4870	3400
	b. *C. decipiens*	1480	1920	2470
	c. *C. compressus*	3700	-	-
	d. *C. curvisetus*	-	-	-
	e. Others	-	-	-
6	*Coscinodiscus*			
	a. *C. oculus iridis*	6500	4850	5460
	b. *C. lineatus*	1800	2900	3400
	c. *C. excentricus*	-	-	-
	d. Others	-	2400	2640
7	*Cyclotella*			
	a. *C. stelligera*	1870	2440	3800
	b. Others	2200	3250	2800
8	*Dynobryon setularia*	2450	3000	3500
9	*Ditylum*			
	a. *D. brightwelli*	3200	2120	2740
	b. Others	-	-	-
10	*Eucamphia*			
	a. *E. zoodiacus*	-	-	-
	b. Others	-	-	-

11	*Fragillaria*			
	a. *F. oceanica*	1900	2100	1460
	b. Others	-	-	-
12	*Gyrosigma*			
	a. *G. balticum*	2450	2600	3140
	b. Others	2140	2800	1800
13	*Lauderia*			
	a. *L. borealis*	5500	6700	7100
	b. Others	-	-	-
14	*Leptocylindricus*			
	a. *L. danicus*	3000	4100	1600
	b. Others	-	-	-
15	*Melosira*			
	a. *M. monilifornas*	-	1500	1200
	b. Others	-	-	-
16	*Navicula*			
	a. *N. longa*	-	-	-
	b. Others	2100	1800	2620
17	*Nitzschia*			
	a. *N. closterium*	4800	2400	3400
	b. *N. striata*	6700	9000	8750
	c. *N. longissima*	-	-	-
	d. Others	-	-	-
18	*Planktoniella*			
	a. *P. sol*	-	2540	2600
	b. Others	-	-	-
19	*Pleurosigma*			
	a. *P. normanii*	2500	3100	2140
	b. *P. elongatum*	2000	-	3140
	c. Others	-	-	-
20	*Rhizosolenia*			
	a. *R. stolterfothii*	2100	2700	3400
	b. *R. shrubsolei*	2950	4100	4500
	c. *R. stliformis*	-	-	-
	d. Others	-	-	-
21	*Skeletonema*			
	a. *S. costatum*	10000	19500	22100
	b. Others	-	-	-
22	*Staurastrum* sp.	4270	6150	3400
23	*Streptotheca*			
	a. *S. thamensis*	-	-	-
	b. Others	-	-	-
24	*Thalassiothrix*			
	a. *T. decipiens*	3000	5420	5000
	b. *T. longissima*	-	-	-

	c. Others	-	-	-
25	*Triceratium*			
	a. *T. reticulate*	-	-	-
	b. *T. favus*	-	-	-
	c. Others	-	-	-
26	*Diatoma*			
	a. Diatoma vulgare	-	2700	3140
27	Other diatoms	-	-	-
II	**Dinoflagellates**			
1	*Ceratium*			
	a. *C. macroceros*	8000	4150	5400
	b. *C. fusus*	1680	2100	3120
	c. *C. longipes*	-	-	-
	d. others	-	-	-
2	*Dinophysis*			
	a. *D. acuta*	4100	4800	5200
	b. Others	-	-	-
3	*Gymnodinium*			
	a. *G. splendens*	-	-	-
	b. *G. rhombodes*	4500	7800	8400
	c. Others	3460	2840	1140
4	*Ornithoceros magnificus*	-	-	-
5	*Peridinium*			
	a. *P. depressum*	2100	1740	2450
	b. *P. divergens*	2740	3150	3500
	c. *P. granii*	-	-	-
	d. *P. excentricum*	-	-	-
	e. Others	-	-	-
6	*Preperidinium*	-	-	-
7	*Noctiluca*			
	a. *N. Scintillans*	2140	2200	1860
	b. Others	-	-	-
III	**Blue green algae**	-	-	-
1	Blue Green Algae	-	-	-
Biomass [wet weight - mg/m^3]		**287.6**	**292.4**	**309.4**

-: Absent

Table 3. Zooplankton diversity (no/m^3) and Biomass (mg/m^3) in the coastal waters off Padubidri during April, 2023

Sl. No.	Fauna	Depth (m)		
		4	8	12
1	**Tintinids**			
	a. *Tintinopsis* sp.	1400	2430	1660
	b. *Rabdonella* sp.	2000	1470	1100
	c. *Favella* sp.	1600	2470	1540
2	**Radiolarians**	-	-	-
3	**Medusae**			
	a. *Obelia* sp.	4730	3470	4860
	b. *Octocostatum* sp.	-	-	-
4	**Siphonophores**			
	a. *Lensia* sp.	2200	5400	5200
	b. *Diphysis* sp.	-	-	-
5	**Ctenophores**			
	a. *Plurobranchia* sp.	2270	1220	1740
6	**Chaetognaths**			
	a.*Sagitta enflata*	-	-	-
	b. *Pterosagitta draco*	-	-	-
	c. *Krohnitta subtilis*	4990	1680	1100
7	**Polychaetes**	2100	2630	1180
8	**Cladocerans**			
	a. *Penilia avirostris*	6400	8000	7800
	b. *Evadnae nordmanni*	-	-	-
9	**Copepods**			
	a. *Calanus finAprilicus*	1900	1600	4210
	b. *Tamora longicornis*	2800	2500	2000
	c. *Parapontella brevicornis*	-	-	-
	d. *Oithona helgolandica*	-	-	-
10	**Copepod nauplius**	1800	1400	-
11	**Lucifer**	-	-	-
12	**Planktonic Urochordates**			
	a. *Frililaria* sp.	-	1940	1140
	b. *Oikopleura* sp.	1870	2500	2610
	c. *Doliolom* sp.	-	-	-
13	**Fish Eggs**	-	-	-
14	**Copepod egg**	1400	2100	2800
15	**Echinoderm Larvae**	-	-	-
16	**Decapod Larvae**	1850	1970	1460
17	**Bivalve Larvae**	1100	1540	-
18	**Fish Larvae**	-	-	-
19	**Polychaete Larvae**	2180	1320	2740
20	**Chaetognath Larvae**	-	-	-
21	Others	11480	24540	10400
Biomass [wet weight - mg/m^3]		**218.53**	**228.52**	**254.12**

Table 4. Macrobenthos diversity (no/m^2) in the coastal waters off Padubidri during April, 2023

Sl. No.	Fauna	Depth (m)		
		4	8	12
I	**Molluscs**			
A	**Bivalves**			
1	*Arca* sp.	24	20	1400
2	*Anadora* sp.	-	11	20
3	Bivalve Spats	105	134	129
4	*Cardium* sp.	-	-	32
5	*Donax* sp.	31	28	21
6	*Katalysia* sp.	-	-	-
7	*Meritrix* sp.	47	-	32
8	*Perna sp*	-	-	-
9	*Modiolus* sp.	-	-	-
10	*Pecten sp.*	-	-	-
B	**Gastropods**			
1	*Babylonia* sp.	-	21	33
2	*Cavolinia* sp.	34	42	31
3	*Cerithedia* sp.	21	45	56
4	*Conus* sp.	-	-	-
5	*Oliva* sp.	-	-	-
6	*Patella* sp.	-	-	41
7	*Surcula* sp.	49	58	35
8	*Telescopium* sp.	41	39	23
9	*Trochus* sp.	-	-	-
10	*Turitella* sp.	-	22	29
11	*Umbonium* sp.	-	-	-
C	**Scaphopods**			

1	*Dentalium* sp.	147	131	97
D	**Other Molluscs**	40	58	62
II	**Echinodermata**			
1	*Astropecten* sp.	-	-	-
2	*Ophiocoma* sp.	34	54	40
3	*Holothuria* sp.	-	-	-
III	**Echiuroids**	-	-	-
IV	**Sipunculids**	-	-	-
V	**Polychaetes**	1120	2140	1400
VI	**Coelenterates**	-	-	-
VII	**Miscellaneous**			
1	Crabs	12	24	20
2	Shrimps	-	21	22
3	Fishes	-	-	-
4	Mud tubes	-	28	32
5	Sand tubes	-	-	-
6	Egg Cases	-	-	-
Density (Individuals/m^2)		**572**	**684**	**802**

- : Absent

Table 5. Results of Bioassay experiment for the coastal waters off Padubidri during April, 2023

1.	Organism Used for the Test	: *Perna viridis* (Green mussel)
2.	Length of the Test Organism	: 3.30 cms (Average)
3.	Weight of the Test Organism	: 1.37 gms (Average)
4.	Test Medium	: Sea water collected from the vicinity of effluent fallout from UPCL, Padubidri
5.	Control	: Filtered sea water
6.	Container	: Glass aquarium of 20 ltr. capacity
7.	Number of Organisms	: 10 in each container
8.	Number of Experiments	: Two
9.	Duration of the Test	: 96 hrs.
10.	Methodology	: Static bioassay

EXPERIMENT

MEDIUM	HOUR / MORTALITY (%)			
	24	48	72	96
CONTROL	Nil	Nil	Nil	Nil
TEST MEDIUM	Nil	Nil	Nil	Nil

Result: No mortality

Table 1. Data on water quality parameters off Padubidri during May, 2023

Sl. No.	Parameters		1	2	3	4	5	6	7
1	Water Temperature (^{0}C)	S	31.00	30.80	31.00	31.20	30.80	30.50	30.40
		SS	29.80	29.60	29.80	30.10	30.00	29.70	29.60
2	pH	S	7.80	7.40	7.20	7.40	7.50	7.40	7.80
		SS	7.30	7.20	7.10	7.20	7.30	7.30	7.60
3	Salinity (psu)	S	34.38	32.50	33.13	32.19	32.81	33.13	33.75
		SS	33.13	32.75	32.00	32.06	32.50	32.81	32.50
4	Dissolved Oxygen (mg/l)	S	7.20	7.20	7.60	7.20	7.60	7.60	7.60
		SS	6.40	5.20	5.60	4.80	6.40	7.20	6.40
5	BOD_3 at 27^{0}C	S	-	2.35	-	-	2.56	-	2.61
		SS		2.19			2.24		2.17
6	COD (mg/l)	S	-	14	-	-	13	-	13
		SS		13			11		12
7	Transparency (m)		4.36	4.42	4.20	4.22	4.87	4.75	4.71
8	Total Suspended Solids (mg/l)		-	480	-	-	320	-	520
9	Total Dissolved Solids (mg/l)		-	40420	-	-	40780	-	40460
10	Ammonia (µg-at/l)	S	7.608	11.75	14.783	7.175	4.409	8.645	5.619
		SS	5.360	11.41	9.682	4.150	6.916	9.423	10.460
11	Nitrite (µg-at/l)	S	1.785	1.523	1.404	1.142	1.642	1.880	1.690
		SS	1.071	0.738	1.142	0.928	1.380	1.119	1.476
12	Nitrate (µg-at/l)	S	3.903	4.474	3.975	3.142	3.998	4.236	3.665
		SS	2.927	3.665	2.999	3.522	3.237	3.475	3.356
13	Phosphate (µg-at/l)	S	2.828	2.121	2.071	2.222	2.424	2.727	2.424
		SS	1.162	1.465	1.364	1.414	1.212	1.061	1.566
14	Silicate (µg-at/l)	S	13.12	12.12	12.56	13.51	12.48	14.21	12.63
		SS	11.48	12.45	13.41	12.14	12.30	13.21	12.14
15	Oil and Grease (mg/l)	S	BDL	BDL	BDL	BDL	BDL	BDL	BDL

BDL: Below Detectable Level

Table 2. Phytoplankton diversity (no/m^3) and Biomass (mg/m^3) in the coastal waters off Padubidri during May, 2023

Sl. No.	Flora	Depth (m)		
		4	8	12
I	**Diatoms**			
1	*Asterionella*			
	a. *A. japonica*	2750	3140	2000
	b. Others	-	-	-
2	*Bacteriastrum*			
	a. *B. varians*	-	-	-
	b. Others	-	-	-
3	*Biddulphia*			
	a. *Biddulphia regia*	1800	2410	2740
	b. *B.sinensis*	-	-	-
	c. *Biddulphia mobiliensis*	-	3250	4000
	d. Others	3500	3100	2800
4	*Cerataulina*			
	a. *C. perlagica*	1800	1600	2240
	b. Others	-	-	-
5	*Chaetoceros*			
	a. *C. lorenzianus*	2150	3100	3000
	b. *C. decipiens*	1200	1800	2740
	c. *C. compressus*	3080	2400	-
	d. *C. curvisetus*	-	-	-
	e. Others	-	-	-
6	*Coscinodiscus*			
	a. *C. oculus iridis*	5840	4500	5120
	b. *C. lineatus*	1940	3100	3000
	c. *C. excentricus*	-	-	-
	d. Others	-	2140	2500
7	*Cyclotella*			
	a. *C. stelligera*	2000	2870	2920
	b. Others	2230	2850	3210
8	*Dynobryon setularia*	2600	3170	3690
9	*Ditylum*			
	a. *D. brightwelli*	3100	2300	2960
	b. Others	-	-	-
10	*Eucamphia*			
	a. *E. zoodiacus*	-	-	-
	b. Others	-	-	-

11	*Fragillaria*			
	a. *F. oceanica*	2000	2400	1500
	b. Others	-	-	-
12	*Gyrosigma*			
	a. *G. balticum*	2600	2900	3000
	b. Others	2200	2400	2120
13	*Lauderia*			
	a. *L. borealis*	5100	5400	5820
	b. Others	-	-	-
14	*Leptocylindricus*			
	a. *L. danicus*	3100	4000	2260
	b. Others	-	-	-
15	*Melosira*			
	a. *M. monilifornas*	-	1780	1320
	b. Others	-	-	-
16	*Navicula*			
	a. *N. longa*	-	-	-
	b. Others	2230	1900	2740
17	*Nitzschia*			
	a. *N. closterium*	4700	2660	3120
	b. *N. striata*	5440	7520	6590
	c. *N. longissima*	-	-	-
	d. Others	-	-	-
18	*Planktoniella*			
	a. *P. sol*	3450	-	3150
	b. Others	-	-	-
19	*Pleurosigma*			
	a. *P. normanii*	2340	3470	2760
	b. *P. elongatum*	2640	-	3200
	c. Others	-	-	-
20	*Rhizosolenia*			
	a. *R. stolterfothii*	2320	2620	3120
	b. *R. shrubsolei*	3000	3780	3980
	c. *R. stliformis*	-	-	-
	d. Others	-	-	-
21	*Skeletonema*			
	a. *S. costatum*	12500	17400	21800
	b. Others	-	-	-
22	*Staurastrum* sp.	4300	6000	3710
23	*Streptotheca*			
	a. *S. thamensis*	-	-	-
	b. Others	-	-	-
24	*Thalassiothrix*			
	a. *T. decipiens*	3210	5680	5160
	b. *T. longissima*	-	-	-

	c. Others	-	-	-
25	*Triceratium*			
	a. *T. reticulate*	-	-	-
	b. *T. favus*	-	-	-
	c. Others	-	-	-
26	*Diatoma*			
	a. Diatoma vulgare	2210	2780	3260
27	Other diatoms	-	-	-
II	**Dinoflagellates**			
1	*Ceratium*			
	a. *C. macroceros*	7480	4250	5620
	b. *C. fusus*	1780	2200	3200
	c. *C. longipes*	-	-	-
	d. others	-	-	-
2	*Dinophysis*			
	a. *D. acuta*	4280	4790	5340
	b. Others	-	-	-
3	*Gymnodinium*			
	a. *G. splendens*	-	-	-
	b. *G. rhombodes*	4480	6790	7810
	c. Others	3620	2980	1540
4	*Ornithoceros magnificus*	-	-	-
5	*Peridinium*			
	a. *P. depressum*	2300	1900	2860
	b. *P. divergens*	2960	3450	3610
	c. *P. granii*	-	-	-
	d. *P. excentricum*	-	-	-
	e. Others	-	-	-
6	*Preperidinium*	-	-	-
7	*Noctiluca*			
	a. *N. Scintillans*	2340	2300	1700
	b. Others	-	-	-
III	**Blue green algae**	-	-	-
1	Blue Green Algae	-	-	-
Biomass [wet weight - mg/m^3]		**295.1**	**296.2**	**315.4**

-: Absent

Table 3. Zooplankton diversity (no/m^3) and Biomass (mg/m^3) in the coastal waters off Padubidri during May, 2023

Sl. No.	Fauna	Depth (m)		
		4	8	12
1	**Tintinids**			
	a. *Tintinopsis* sp.	1550	2210	1710
	b. *Rabdonella* sp.	2310	1570	1140
	c. *Favella* sp.	1410	1870	1650
2	**Radiolarians**	-	-	-
3	**Medusae**			
	a. *Obelia* sp.	4970	3610	4610
	b. *Octocostatum* sp.	-	-	-
4	**Siphonophores**			
	a. *Lensia* sp.	2310	5500	5130
	b. *Diphysis* sp.	-	-	-
5	**Ctenophores**			
	a. *Plurobranchia* sp.	2280	1240	1840
6	**Chaetognaths**			
	a.*Sagitta enflata*	-	-	-
	b. *Pterosagitta draco*	-	-	-
	c. *Krohnitta subtilis*	3420	2180	1940
7	**Polychaetes**	2300	2700	1470
8	**Cladocerans**			
	a. *Penilia avirostris*	6100	7400	7180
	b. *Evadnae nordmanni*	-	-	-
9	**Copepods**			
	a. *Calanus finMayicus*	2000	1640	2370
	b. *Tamora longicornis*	2740	2610	2300
	c. *Parapontella brevicornis*	-	-	-
	d. *Oithona helgolandica*	-	-	-
10	**Copepod nauplius**	1940	1650	-
11	**Lucifer**	-	-	-
12	**Planktonic Urochordates**			
	a. *Frililaria* sp.	-	2140	1470
	b. *Oikopleura* sp.	1640	2200	2410
	c. *Doliolom* sp.	-	-	-
13	**Fish Eggs**	-	-	-
14	**Copepod egg**	1800	2140	2450
15	**Echinoderm Larvae**	-	-	-
16	**Decapod Larvae**	2050	2710	2450
17	**Bivalve Larvae**	1820	2130	-
18	**Fish Larvae**	-	-	-
19	**Polychaete Larvae**	2330	1840	1940
20	**Chaetognath Larvae**	-	-	-
21	Others	12400	19450	11200
Biomass [wet weight - mg/m^3]		**226.14**	**221.23**	**231.13**

Table 4. Macrobenthos diversity (no/m^2) in the coastal waters off Padubidri during May, 2023

Sl. No.	Fauna	Depth (m)		
		4	8	12
I	**Molluscs**			
A	**Bivalves**			
1	*Arca* sp.	18	23	850
2	*Anadora* sp.	23	42	31
3	Bivalve Spats	86	92	98
4	*Cardium* sp.	12	-	28
5	*Donax* sp.	42	34	26
6	*Katalysia* sp.	-	-	-
7	*Meritrix* sp.	35	-	30
8	*Perna sp*	-	-	-
9	*Modiolus* sp.	-	-	-
10	*Pecten sp.*	-	-	-
B	**Gastropods**			
1	*Babylonia* sp.	-	27	26
2	*Cavolinia* sp.	37	41	36
3	*Cerithedia* sp.	35	40	47
4	*Conus* sp.	-	-	-
5	*Oliva* sp.	-	-	-
6	*Patella* sp.	-	10	37
7	*Surcula* sp.	38	45	29
8	*Telescopium* sp.	36	43	31
9	*Trochus* sp.	-	-	-
10	*Turitella* sp.	13	27	27
11	*Umbonium* sp.	-	-	-
C	**Scaphopods**			
1	*Dentalium* sp.	94	75	81

D	**Other Molluscs**	41	51	54
II	**Echinodermata**			
1	*Astropecten* sp.	-	-	-
2	*Ophiocoma* sp.	32	51	42
3	*Holothuria* sp.	-	-	-
III	**Echiuroids**	-	-	-
IV	**Sipunculids**	-	-	-
V	**Polychaetes**	1160	1740	1240
VI	**Coelenterates**	-	-	-
VII	**Miscellaneous**			
1	Crabs	-	14	16
2	Shrimps	-	-	19
3	Fishes	-	-	-
4	Mud tubes	-	42	38
5	Sand tubes	-	-	-
6	Egg Cases	-	-	-
Density (Individuals/m^2)		**547**	**661**	**810**

- : Absent

Table 5. Results of Bioassay experiment for the coastal waters off Padubidri during May, 2023

1.	Organism Used for the Test	: *Perna viridis* (Green mussel)
2.	Length of the Test Organism	: 2.89 cms (Average)
3.	Weight of the Test Organism	: 1.23 gms (Average)
4.	Test Medium	: Sea water collected from the vicinity of effluent fallout from UPCL, Padubidri
5.	Control	: Filtered sea water
6.	Container	: Glass aquarium of 20 ltr. capacity
7.	Number of Organisms	: 10 in each container
8.	Number of Experiments	: Two
9.	Duration of the Test	: 96 hrs.
10.	Methodology	: Static bioassay

EXPERIMENT

MEDIUM	HOUR / MORTALITY (%)			
	24	48	72	96
CONTROL	Nil	Nil	Nil	Nil
TEST MEDIUM	Nil	Nil	Nil	Nil

Result: No mortality

Table 1. Data on water quality parameters in the beach waters of Padubidri during June, 2023.

Sl. No.	Parameters	Stations		
		1	2	3
1.	Temperature (^{0}C)	28.7	28.9	28.8
2.	pH	7.80	7.90	7.9
3.	Salinity (ppt)	29.00	29.00	28.00
4.	Dissolved Oxygen (mg/l)	6.8	6.8	6.4
5.	BOD_3 (mg/l)	3.2	3.6	3.2
6.	COD (mg/l)	15.00	12.50	13.85
7.	Turbidity (NTU)	95.62	110.50	112.10
8.	Total Suspended Solids (mg/l)	126.56	145.32	138.60
9.	Total Dissolved Solids (mg/l)	26700	28900	27400
10.	Ammonia (µg-at/l)	7.90	11.23	10.47
11.	Nitrite (µg-at/l)	0.56	0.43	0.61
12.	Nitrate (µg-at/l)	4.12	3.89	3.41
13.	Phosphate (µg-at/l)	0.77	0.81	0.65
14.	Silicate (µg-at/l)	25.64	24.26	27.00
15.	Oil and Grease (mg/l)	BDL	BDL	BDL

BDL: Below Detectable Level

Table 2. Phytoplankton diversity (no/m^3) and biomass (mg/m^3) in the Beach waters of Padubidri during June, 2023.

Sl. No.	Flora	Stations		
		1	2	3
I	**DIATOMS**			
1.	*Asterionella*	1800	1400	1300
2.	*Bacteriastrum*	-	-	-
3.	*Biddulphia*	-	800	-
4.	*Cerataulina*	2150	2310	1940
5.	*Chaetoceros*	1450	860	1210
6.	*Coscinodiscus*	-	900	-
7.	*Cyclotella*	-	-	-
8.	*Ditylum*	2030	1500	1940
9.	*Dynobryon*	-	-	-
10.	*Eucamphia*	-	-	-
11.	*Fragillaria*	1640	1870	1600
12.	*Gyrosigma*	2480	1520	1740
13.	*Lauderia*	-	-	-
14.	*Leptocylindricus*	-	-	-
15.	*Melosira*	-	-	-
16.	*Navicula*	-	-	1070
17.	*Nitzschia*	1460	1230	2490
18.	*Pediastrum*	-	-	-
19.	*Planktoniella*	1370	1480	2210
20.	*Pleurosigma*	870	1340	1960
21.	*Rhizosolenia*	-	-	-
22.	*Skeletonema*	940	1000	1450
23.	*Staurastrum*	-	-	-
24.	*Streptotheca*	-	-	-
25.	*Thallassiothrix*	1150	2130	1470
26.	*Triceratium*	2600	-	-
27.	***Other diatoms***	-	-	-
II	**DINOFLAGELLATES**			
1.	*Ceratium*	1480	1670	1940
2.	*Dinophysis*	1890	2510	2310
3.	*Gymnodinium*	8950	7840	13500
4.	*Ornithoceros*	-	-	-
5.	*Peridinium*	1760	-	2170
6.	*Preperidinium*	-	-	-
7.	*Noctiluca*	-	-	-
III	**BLUE GREEN ALGAE**			
1.	**Blue Green Algae**	9000	10000	7900
Biomass (mg/m^3)		**148.26**	**158.32**	**162.45**

Table 3. Zooplankton diversity (no/m^3) and biomass (mg/m^3) in the beach waters of Padubidri during June, 2023.

Sl. No.	Fauna	Stations		
		1	2	3
1.	Tintinids	8900	10800	6900
2.	Medusae	–	–	–
3.	Ctenophore	–	–	–
4.	Chaetognath	1650	2800	2250
5.	Chaetognath Larvae	2700	-	4500
6.	Polychaete	-	-	-
7.	Polychaete Larvae	–	–	–
8.	Cladocera	4500	3500	2550
9.	Ostracoda	–	–	–
10.	Rotifera	–	–	–
11.	Copepod	3000	2650	4850
12.	Copepod nauplius	1500	2350	2950
13.	Copepod egg	-	-	-
14.	Lucifer	5600	4800	3500
15.	Decapod Larvae	–	–	–
16.	Gastropod Larvae	–	–	–
17.	Barnacle Larvae	-	-	-
18.	Bivalve Larvae	1500	1450	1350
19.	Echinoderm Larvae	–	–	–
20.	*Oikopleura*	-	1350	1450
21.	Doliolids	–	–	–
22.	*Lensia*	2000	1950	1300
23.	*Creseis*	1550	2350	2500
24.	*Cavolinia*	–	–	–
25.	Fish Eggs	–	–	–
26.	Fish Larvae	-	-	-
Biomass (mg/m^3)		**195.56**	**195.29**	**221.51**

'-': Absent

Table 4. Macrobenthos diversity (no/m^2) and density (no/m^2) in the beach waters of Padubidri during June, 2023.

Sl. No.	Fauna	Stations		
		1	2	3
I	**Echiuroids**	-	-	-
II	**Sipunculids**	-	-	-
III	**Mud tubes**	-	-	-
IV	**Sand tubes**	-	-	-
V	**Polychaetes**	185	270	210
VI	**Coelenterates**	-	-	-
VII	**Molluscs**			
1.	*Arca*	17	29	35
2.	*Anadora*	110	85	178
3.	*Auger*	-	-	-
4.	*Babylion*	12	15	-
5.	Bivalve Spats	26	15	24
6.	*Cardium*	-	-	-
7.	*Cavolinia*	-	-	-
8.	*Cerithedia*	-	-	-
9.	*Conus*	-	14	30
10.	*Dentalium*	32	28	26
11.	*Donax*	89	124	98
12.	*Drupa*	87	156	149
13.	*Katalysia*	-	-	-
14.	*Littorina*	-	-	-
15.	*Meritrix*	24	19	23
16.	*Modiolus*	-	-	-
17.	*Oliva*	-	-	-
18.	*Patella*	-	-	-
19.	Scallop	-	-	-
20.	*Surcula*	-	-	-
21.	*Telescopium*	-	-	-
22.	*Trochus*	-	-	-
23.	*Turitella*	28	21	15
24.	*Umbonium*	-	-	-
25.	Other Molluscs	28	-	18
VIII	**Echinodermata**			
1.	*Astropecten*	-	-	-
2.	*Ophiocoma*	-	-	-
3.	Egg Cases	75	45	31
IX	**Miscellaneous**			
1.	Crab	19	18	23
2.	Shrimp	60	32	16
3.	Fish	-	-	-
Density (Individuals/m^2)		**215**	**231**	**203**

Table 5. Results of Bioassay experiment in the beach waters of Padubidri during June, 2023.

1	Test Organism	:	Green Mussel (*Perna viridis*)
2	Number of Test Organisms	:	10 per replicate
3	Number of Replicates	:	3 for each treatment
4	Size (Average)	:	3.10 – 3.70 cm

EXPERIMENT

Medium	Mortality			
	24h	48h	72h	96h
Control (aged seawater)	Nil	Nil	Nil	Nil
50% seawater from station 2 + 50% aged seawater	Nil	Nil	Nil	Nil
100% seawater from station 2	Nil	Nil	Nil	Nil

Table 1. Data on water quality parameters in the beach waters of Padubidri during July,2023.

Sl. No.	Parameters	Stations		
		1	2	3
1.	Temperature (^{0}C)	28.70	28.60	28.70
2.	pH	7.90	7.90	7.80
3.	Salinity (ppt)	24.38	23.75	25.00
4.	Dissolved Oxygen (mg/l)	6.40	6.80	6.40
5.	BOD_3 (mg/l)	1.2	1.6	1.2
6.	COD (mg/l)	15.89	14.56	15.48
7.	Turbidity (NTU)	99.56	95.56	98.33
8.	Total Suspended Solids (mg/l)	112.65	156.65	132.70
9.	Total Dissolved Solids (mg/l)	22500	23100	23600
10.	Ammonia (µg-at/l)	7.43	7.35	9.60
11.	Nitrite (µg-at/l)	1.99	2.31	2.17
12.	Nitrate (µg-at/l)	6.81	6.10	4.55
13.	Phosphate (µg-at/l)	2.78	2.68	2.48
14.	Silicate (µg-at/l)	26.33	27.23	26.12
15.	Oil and Grease (mg/l)	BDL	BDL	BDL

BDL: Below Detectable Level

Table 2. Phytoplankton diversity (no/m^3) and biomass (mg/m^3) in the Beach waters of Padubidri during July,2023.

Sl. No.	Flora	Stations		
		1	2	3
I	**DIATOMS**			
1.	*Asterionella*	1440	1630	1500
2.	*Bacteriastrum*	–	–	–
3.	*Biddulphia*	1640	1450	1630
4.	*Cerataulina*	1630	1350	1230
5.	*Chaetoceros*	1630	5600	1600
6.	*Coscinodiscus*	2700	2750	2360
7.	*Cyclotella*	2500	3900	6900
8.	*Ditylum*	1100	1250	2900
9.	*Dynobryon*	-	-	-
10.	*Eucamphia*	-	-	-
11.	*Fragillaria*	1700	900	1200
12.	*Gyrosigma*	800	1300	750
13.	*Lauderia*	-	-	-
14.	*Leptocylindricus*	-	-	-
15.	*Melosira*	-	-	-
16.	*Navicula*	-	-	
17.	*Nitzschia*	2800	2000	3500
18.	*Pediastrum*	-	-	-
19.	*Planktoniella*	1950	1600	1250
20.	*Pleurosigma*	1360	1990	1200
21.	*Rhizosolenia*	-	-	-
22.	*Skeletonema*	-	-	-
23.	*Staurastrum*	-	-	-
24.	*Streptotheca*	-	-	-
25.	*Thallassiothrix*	2500	3400	2100
26.	*Triceratium*	1600	2600	1500
27.	***Other diatoms***	-	-	-
II	**DINOFLAGELLATES**			
1.	*Ceratium*	2000	2700	3500
2.	*Dinophysis*	1950	2200	1100
3.	*Gymnodinium*	–	–	–
4.	*Ornithoceros*	-	-	-
5.	*Peridinium*	1900	900	1200
6.	*Preperidinium*	-	-	-
7.	*Noctiluca*	-	-	-
III	**BLUE GREEN ALGAE**			
1.	**Blue Green Algae**	15000	14000	12000
Biomass (mg/m^3)		**163.42**	**158.22**	**134.09**

Table 3. Zooplankton diversity (no/m^3) and biomass (mg/m^3) in the beach waters of Padubidri during July,2023.

Sl. No.	Fauna	Stations		
		1	2	3
1.	Tintinids	1200	1600	1900
2.	Medusae	–	–	–
3.	Ctenophore	–	–	–
4.	Chaetognath	–	–	–
5.	Chaetognath Larvae	–	–	–
6.	Polychaete	1600	1550	1800
7.	Polychaete Larvae	–	–	–
8.	Cladocera	3500	4500	2700
9.	Ostracoda	–	–	–
10.	Rotifera	–	–	–
11.	Copepod	12200	16000	14500
12.	Copepod nauplius	1600	1800	2500
13.	Copepod egg	–	–	–
14.	Lucifer	–	–	–
15.	Decapod Larvae	110	190	200
16.	Gastropod Larvae	–	–	–
17.	Barnacle Larvae	-	-	-
18.	Bivalve Larvae	1400	1300	1900
19.	Echinoderm Larvae	-	-	-
20.	*Oikopleura*	1200	1500	1200
21.	Doliolids	–	–	–
22.	*Lensia*	–	–	–
23.	*Creseis*	–	–	–
24.	*Cavolinia*	–	–	–
25.	Fish Eggs	–	–	–
26.	Fish Larvae	-	-	-
Biomass (mg/m^3)		**118.04**	**108.63**	**125.44**

'-': Absent

Table 4. Macrobenthos diversity (no/m^2) and density (no/m^2) in the beach waters of Padubidri during July,2023.

Sl. No.	Fauna	Stations		
		1	2	3
I	**Echiuroids**	-	-	-
II	**Sipunculids**	-	-	-
III	**Mud tubes**	-	-	-
IV	**Sand tubes**	-	-	-
V	**Polychaetes**	-	-	-
VI	**Coelenterates**	-	-	-
VII	**Molluscs**			
1.	*Arca*	20	10	15
2.	*Anadora*	-	-	-
3.	*Auger*	-	-	-
4.	*Babylion*	-	-	-
5.	Bivalve Spats	15	15	25
6.	*Cardium*	-	-	-
7.	*Cavolinia*	-	-	-
8.	*Cerithedia*	-	-	-
9.	*Conus*	25	30	20
10.	*Dentalium*	60	35	25
11.	*Donax*	23	-	-
12.	*Drupa*	-	-	-
13.	*Katalysia*	-	-	-
14.	*Littorina*	-	-	-
15.	*Meritrix*	20	25	30
16.	*Modiolus*	-	-	-
17.	*Oliva*	-	-	-
18.	*Patella*	-	-	-
19.	Scallop	-	-	-
20.	*Surcula*	-	-	-
21.	*Telescopium*	-	-	-
22.	*Trochus*	-	-	-
23.	*Turitella*	25	15	20
24.	*Umbonium*	-	-	-
25.	Other Molluscs	15	-	20
VIII	**Echinodermata**			
1.	*Astropecten*	-	-	-
2.	*Ophiocoma*	-	-	-
3.	Egg Cases	15	20	15
IX	**Miscellaneous**			
1.	Crab	10	20	30
2.	Shrimp	-	-	11
3.	Fish	-	-	-
Density (Individuals/m^2)		**110**	**140**	**160**

Table 5. Results of Bioassay experiment in the beach waters of Padubidri during July,2023.

1	Test Organism	:	Green Mussel (*Perna viridis*)
2	Number of Test Organisms	:	10 per replicate
3	Number of Replicates	:	3 for each treatment
4	Size (Average)	:	3.34 – 3.67 cm

EXPERIMENT

Medium	Mortality			
	24h	48h	72h	96h
Control (aged seawater)	Nil	Nil	Nil	Nil
50% seawater from station 2 + 50% aged seawater	Nil	Nil	Nil	Nil
100% seawater from station 2	Nil	Nil	Nil	Nil

Table 1. Data on water quality parameters in the beach waters of Padubidri during August, 2023.

Sl. No.	Parameters	Stations		
		1	2	3
1.	Temperature (^{0}C)	27.00	27.50	28.20
2.	pH	7.80	7.70	7.80
3.	Salinity (ppt)	26.23	25.12	25.00
4.	Dissolved Oxygen (mg/l)	5.60	6.00	6.80
5.	BOD_3 (mg/l)	1.6	1.2	1.2
6.	COD (mg/l)	12.30	13.40	14.56
7.	Turbidity (NTU)	95.50	93.40	96.20
8.	Total Suspended Solids (mg/l)	110.15	140.50	125.60
9.	Total Dissolved Solids (mg/l)	23200	24600	25700
10.	Ammonia (µg-at/l)	3.80	3.97	3.63
11.	Nitrite (µg-at/l)	1.16	0.88	1.11
12.	Nitrate (µg-at/l)	1.09	1.16	1.95
13.	Phosphate (µg-at/l)	1.36	1.56	2.07
14.	Silicate (µg-at/l)	24.22	25.21	27.11
15.	Oil and Grease (mg/l)	BDL	BDL	BDL

BDL: Below Detectable Level

Table 2. Phytoplankton diversity (no/m^3) and biomass (mg/m^3) in the Beach waters of Padubidri during August, 2023.

Sl. No.	Flora	Stations		
		1	2	3
I	**DIATOMS**			
1.	*Asterionella*	1500	1700	1350
2.	*Bacteriastrum*	–	–	–
3.	*Biddulphia*	1500	-	1850
4.	*Cerataulina*	1200	1600	1400
5.	*Chaetoceros*	1150	4000	-
6.	*Coscinodiscus*	2650	2200	1900
7.	*Cyclotella*	2250	-	-
8.	*Ditylum*	1200	800	1700
9.	*Dynobryon*	-	-	-
10.	*Eucamphia*	-	-	-
11.	*Fragillaria*	1450	1000	1300
12.	*Gyrosigma*	1400	800	1100
13.	*Lauderia*	-	-	-
14.	*Leptocylindricus*	-	-	-
15.	*Melosira*	-	-	-
16.	*Navicula*	1200	-	
17.	*Nitzschia*	2400	1500	-
18.	*Pediastrum*	-	-	-
19.	*Planktoniella*	1100	1300	700
20.	*Pleurosigma*	1000	-	1400
21.	*Rhizosolenia*	-	-	-
22.	*Skeletonema*	-	-	-
23.	*Staurastrum*	-	-	-
24.	*Streptotheca*	-	-	-
25.	*Thallassiothrix*	1900	-	1400
26.	*Triceratium*	-	2300	1100
27.	***Other diatoms***	-	-	-
II	**DINOFLAGELLATES**			
1.	*Ceratium*	2000	-	2100
2.	*Dinophysis*	1100	1400	1600
3.	*Gymnodinium*	–	–	–
4.	*Ornithoceros*	-	-	-
5.	*Peridinium*	1300	900	1600
6.	*Preperidinium*	-	-	-
7.	*Noctiluca*	-	-	-
III	**BLUE GREEN ALGAE**			
1.	**Blue Green Algae**	9000	13000	11000
Biomass (mg/m^3)		**99.15**	**113.65**	**143.89**

Table 3. Zooplankton diversity (no/m^3) and biomass (mg/m^3) in the beach waters of Padubidri during August, 2023.

Sl. No.	Fauna	Stations		
		1	2	3
1.	Tintinids	1100	1600	–
2.	Medusae	–	–	–
3.	Ctenophore	–	–	–
4.	Chaetognath	1300	1900	2400
5.	Chaetognath Larvae	800	900	–
6.	Polychaete	800	1200	1000
7.	Polychaete Larvae	–	500	700
8.	Cladocera	2500	3700	2600
9.	Ostracoda	–	–	–
10.	Rotifera	–	–	–
11.	Copepod	11000	8500	10500
12.	Copepod nauplius	3500	2500	4500
13.	Copepod egg	–	–	–
14.	Lucifer	–	–	–
15.	Decapod Larvae	200	-	300
16.	Gastropod Larvae	–	–	–
17.	Barnacle Larvae	-	-	-
18.	Bivalve Larvae	1100	1000	1200
19.	Echinoderm Larvae	–	–	–
20.	*Oikopleura*	-	800	1300
21.	Doliolids	–	–	–
22.	*Lensia*	–	–	–
23.	*Creseis*	–	–	–
24.	*Cavolinia*	–	–	–
25.	Fish Eggs	–	–	–
26.	Fish Larvae	-	-	-
Biomass (mg/m^3)		**101.32**	**105.50**	**110.00**

'-': Absent

Table 4. Macrobenthos diversity (no/m^2) and density (no/m^2) in the beach waters of Padubidri during August, 2023.

Sl. No.	Fauna	Stations		
		1	2	3
I	**Echiuroids**	-	-	-
II	**Sipunculids**	-	-	-
III	**Mud tubes**	-	-	-
IV	**Sand tubes**	-	-	-
V	**Polychaetes**	150	90	-
VI	**Coelenterates**	-	-	-
VII	**Molluscs**			
1.	*Arca*	19	20	22
2.	*Anadora*	-	-	-
3.	*Auger*	-	-	-
4.	*Babylion*	-	-	-
5.	Bivalve Spats	23	14	14
6.	*Cardium*	-	-	-
7.	*Cavolinia*	-	-	-
8.	*Cerithedia*	-	-	-
9.	*Conus*	-	28	30
10.	*Dentalium*	64	45	60
11.	*Donax*	30	56	64
12.	*Drupa*	-	-	-
13.	*Katalysia*	-	-	-
14.	*Littorina*	-	-	-
15.	*Meritrix*	25	19	20
16.	*Modiolus*	-	-	-
17.	*Oliva*	-	-	-
18.	*Patella*	-	-	-
19.	Scallop	-	-	-
20.	*Surcula*	-	-	-
21.	*Telescopium*	-	-	-
22.	*Trochus*	-	-	-
23.	*Turitella*	15	23	40
24.	*Umbonium*	-	-	-
25.	Other Molluscs	36	34	18
VIII	**Echinodermata**			
1.	*Astropecten*	-	-	-
2.	*Ophiocoma*	-	-	-
3.	Egg Cases	18	19	23
IX	**Miscellaneous**			
1.	Crab	38	29	43
2.	Shrimp	-	-	46
3.	Fish	-	-	-
Density (Individuals/m^2)		**418**	**377**	**380**

Table 5. Results of Bioassay experiment in the beach waters of Padubidri during August, 2023.

1	Test Organism	:	Green Mussel (*Perna viridis*)
2	Number of Test Organisms	:	10 per replicate
3	Number of Replicates	:	3 for each treatment
4	Size (Average)	:	3.20 – 3.61 cm

EXPERIMENT

Medium	Mortality			
	24h	48h	72h	96h
Control (aged seawater)	Nil	Nil	Nil	Nil
50% seawater from station 2 + 50% aged seawater	Nil	Nil	Nil	Nil
100% seawater from station 2	Nil	Nil	Nil	Nil

Table 1. Data on water quality parameters in the beach waters of Padubidri during September,2023.

Sl. No.	Parameters	Stations		
		1	2	3
1.	Temperature (^{0}C)	29.20	29.50	29.80
2.	pH	7.70	7.60	7.90
3.	Salinity (ppt)	24.00	24.50	24.30
4.	Dissolved Oxygen (mg/l)	7.2	6.65	6.35
5.	BOD_3 (mg/l)	1.3	1.5	1.4
6.	COD (mg/l)	14.26	15.35	15.63
7.	Turbidity (NTU)	96.24	92.22	97.41
8.	Total Suspended Solids (mg/l)	142.70	166.25	128.50
9.	Total Dissolved Solids (mg/l)	23300	26200	25300
10.	Ammonia (µg-at/l)	6.91	3.71	4.06
11.	Nitrite (µg-at/l)	1.28	1.42	1.23
12.	Nitrate (µg-at/l)	0.97	1.10	0.47
13.	Phosphate (µg-at/l)	3.03	2.99	2.56
14.	Silicate (µg-at/l)	25.60	26.28	24.72
15.	Oil and Grease (mg/l)	BDL	BDL	BDL

BDL: Below Detectable Level

Table 2. Phytoplankton diversity (no/m^3) and biomass (mg/m^3) in the Beach waters of Padubidri during September,2023.

Sl. No.	*Flora*	Stations		
		1	2	3
I	**DIATOMS**			
1.	*Asterionella*	1863	1752	1321
2.	*Bacteriastrum*	–	–	–
3.	*Biddulphia*	1520	1850	1720
4.	*Cerataulina*	1250	1420	1630
5.	*Chaetoceros*	1520	4900	5230
6.	*Coscinodiscus*	3250	2560	3120
7.	*Cyclotella*	5620	6860	5990
8.	*Ditylum*	1650	2060	1970
9.	*Dynobryon*	-	-	-
10.	*Eucamphia*	-	-	-
11.	*Fragillaria*	1620	1300	1190
12.	*Gyrosigma*	1260	1900	980
13.	*Lauderia*	-	-	-
14.	*Leptocylindricus*	-	-	-
15.	*Melosira*	-	-	-
16.	*Navicula*	-	-	
17.	*Nitzschia*	4200	3570	2690
18.	*Pediastrum*	-	-	-
19.	*Planktoniella*	1640	1150	1980
20.	*Pleurosigma*	1760	1280	1410
21.	*Rhizosolenia*	-	-	-
22.	*Skeletonema*	-	-	-
23.	*Staurastrum*	-	-	-
24.	*Streptotheca*	-	-	-
25.	*Thallassiothrix*	3650	2930	1960
26.	*Triceratium*	1980	2200	2520
27.	***Other diatoms***	-	-	-
II	**DINOFLAGELLATES**			
1.	*Ceratium*	2900	3200	3500
2.	*Dinophysis*	1630	2310	2630
3.	*Gymnodinium*	–	–	–
4.	*Ornithoceros*	-	-	-
5.	*Peridinium*	800	1900	1100
6.	*Preperidinium*	-	-	-
7.	*Noctiluca*	-	-	-
III	**BLUE GREEN ALGAE**			
1.	**Blue Green Algae**	13000	16000	14000
Biomass (mg/m^3)		**152.26**	**176.28**	**142.24**

Table 3. Zooplankton diversity (no/m^3) and biomass (mg/m^3) in the beach waters of Padubidri during September,2023.

Sl. No.	Fauna	Stations		
		1	2	3
1.	Tintinids	1400	1300	1500
2.	Medusae	–	–	–
3.	Ctenophore	–	–	–
4.	Chaetognath	–	–	–
5.	Chaetognath Larvae	–	–	–
6.	Polychaete	1650	1700	1420
7.	Polychaete Larvae	–	–	–
8.	Cladocera	4800	3200	3900
9.	Ostracoda	–	–	–
10.	Rotifera	–	–	–
11.	Copepod	13520	13600	14600
12.	Copepod nauplius	2750	1700	2100
13.	Copepod egg	–	–	–
14.	Lucifer	–	–	–
15.	Decapod Larvae	180	110	280
16.	Gastropod Larvae	–	–	–
17.	Barnacle Larvae	-	-	-
18.	Bivalve Larvae	1600	1500	1800
19.	Echinoderm Larvae	-	-	-
20.	*Oikopleura*	1100	1800	1900
21.	Doliolids	–	–	–
22.	*Lensia*	–	–	–
23.	*Creseis*	–	–	–
24.	*Cavolinia*	–	–	–
25.	Fish Eggs	–	–	–
26.	Fish Larvae	-	-	-
Biomass (mg/m^3)		**121.32**	**130.31**	**128.29**

'-': Absent

Table 4. Macrobenthos diversity (no/m^2) and density (no/m^2) in the beach waters of Padubidri during September,2023.

Sl. No.	Fauna	Stations		
		1	2	3
I	**Echiuroids**	-	-	-
II	**Sipunculids**	-	-	-
III	**Mud tubes**	-	-	-
IV	**Sand tubes**	-	-	-
V	**Polychaetes**	-	-	-
VI	**Coelenterates**	-	-	-
VII	**Molluscs**			
1.	*Arca*	25	20	10
2.	*Anadora*	-	-	-
3.	*Auger*	-	-	-
4.	*Babylion*	-	-	-
5.	Bivalve Spats	20	25	15
6.	*Cardium*	-	-	-
7.	*Cavolinia*	-	-	-
8.	*Cerithedia*	-	-	-
9.	*Conus*	35	25	30
10.	*Dentalium*	45	20	35
11.	*Donax*	50	35	45
12.	*Drupa*	-	-	-
13.	*Katalysia*	-	-	-
14.	*Littorina*	-	-	-
15.	*Meritrix*	25	20	35
16.	*Modiolus*	-	-	-
17.	*Oliva*	10	15	10
18.	*Patella*	-	-	-
19.	*Scallop*	-	-	-
20.	*Surcula*	-	-	-
21.	*Telescopium*	-	-	-
22.	*Trochus*	-	-	-
23.	*Turitella*	20	25	10
24.	*Umbonium*	-	-	-
25.	Other Molluscs	10	25	20
VIII	**Echinodermata**			
1.	*Astropecten*	-	-	-
2.	*Ophiocoma*	-	-	-
3.	Egg Cases	25	10	15
IX	**Miscellaneous**			
1.	Crab	35	25	20
2.	Shrimp	20	15	10
3.	Fish	-	-	-
Density (Individuals/m^2)		**130**	**180**	**120**

Table 5. Results of Bioassay experiment in the beach waters of Padubidri during September,2023.

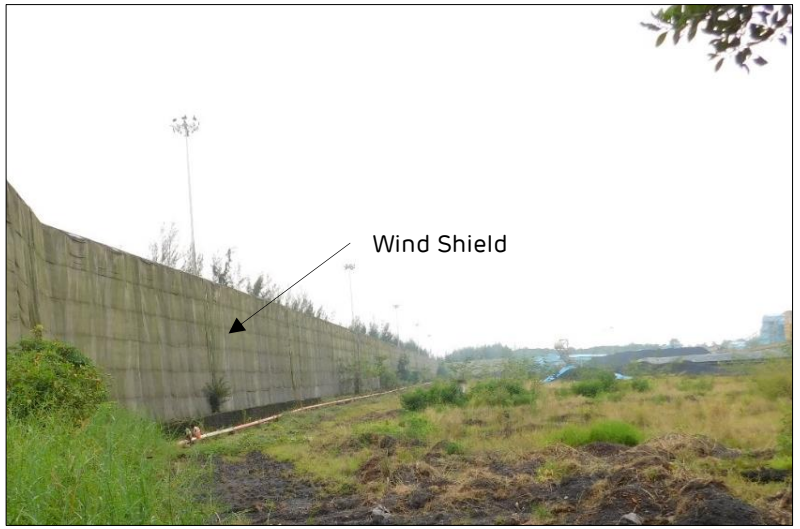
1	Test Organism	:	Green Mussel (*Perna viridis*)
2	Number of Test Organisms	:	10 per replicate
3	Number of Replicates	:	3 for each treatment
4	Size (Average)	:	3.25 – 3.72 cm

EXPERIMENT

Medium	Mortality			
	24h	48h	72h	96h
Control (aged seawater)	Nil	Nil	Nil	Nil
50% seawater from station 2 + 50% aged seawater	Nil	Nil	Nil	Nil
100% seawater from station 2	Nil	Nil	Nil	Nil

Coal Handling Plant – Wind Shield

Annexure - II



Annexure-III

Fly Ash Generation & Utilization for the period of April' 2023 to September' 2023

Month	Ash Generation			Ash Utilization			% Utilization
	Fly Ash (MT)	Bottom Ash (MT)	Total Ash Generation (MT)	Fly Ash (MT)	Bottom Ash + Pond ash (MT)	Total Ash Utilization (MT)	
Apr-23	9761.00	1719.00	11480.00	8380.96	1890.10	10271.06	89.47
May-23	6549.00	931.00	7480.00	7176.21	1129.11	8305.32	111.03
Jun-23	8749.55	1247.62	9997.17	9049.61	1265.62	10315.23	103.18
July-23	1844.50	478.61	2323.11	3745.65	478.61	4224.26	181.84
Aug-23	5987.00	1360.42	7347.42	6003.54	1360.42	7363.96	100.23
Sep-23	8912.57	2131.88	11044.45	7322.57	2131.88	9454.45	85.60
Total	**41,803.62**	**7,868.53**	**49,672.15**	**41,678.54**	**8,255.74**	**49,934.28**	**100.53**

Rainwater Harvesting Ponds

Annexure - IV

Three Numbers of Rainwater Harvesting Ponds constructed to conserve rainwater.

Annexure - V

Green Belt development:

Plantation was carried in and around plant premises with local species.
Total plantation carried so far is around 398505 No's in 195 acres.

Plantation Details	Area (Acres)
398505 Saplings	**195**

List of the Plant Species planted in and around the UPCL plant premises.

Sl. No.	Species
1	Honge
2	Neem
3	Mahagani
4	T. Rosea
5	Melengia
6	Seetha Ashoka
7	Alstonia
8	T. Arjuna
9	Honne
10	Kadu Badami
11	Lebeka
12	Leqestonia
13	Nerale
14	Peltaform
15	Rain Tree
16	Gulmava
17	Beete
18	Cassurina
19	Holenandi
20	May Flower
21	Palaksha
22	Garige
23	Budubende
24	Surage
25	Dhupa
26	Basavanapada
27	Jack Fruit
28	Ramatre
29	Coconut Plant

Roadside Plantation

Thick plantation near Coal Handling Plant on both sides of the Road

Plantation developed all along the Outside boundary

Plantation developed all along the Inside boundary

Gardening Plantation developed

Vegetable & Fruit Plantation developed

Plantation near Fly Ash silo

Plantation developed Surrounding Guest House

ANNEXURE-VI

Activities & Financials of CSR for the period April'2023 to September'2023 for APL Udupi TPP

Activity Head		Educational Initiatives	Community Health Care	Community Infrastructure Development	Impromptu Nature of Expenses (Promotion of Environment)	Administrative Expenses	Total Expenditure
Activity		**Education Kits**	**Mobile Health Care Unit**	**Safe Drinking Water Unit**	**Social Forestation**	**Salaries / Manpower Cost**	
April, 2023	Programme	-					**0**
	Amt. Rs.						
May, 2023	Programme	-				Salaries / Manpower Cost	**234658**
	Amt. Rs.	-				**234658**	
June, 2023	Programme	-	Free Medical Services Through Mobile Health Care Unit	Providing Potable Drinking Water Through Ro Plants	-	Salaries / Manpower Cost	**477199**
	Amt. Rs.		**327420**	**32450**		**117329**	

July, 2023	Programme	Distribution Of Education Kits (Notebooks, Geometry Box, School Bag and Umbrella) To **6,730** Government School Students	Free Medical Services Through Mobile Health Care Unit	-	-	Salaries / Manpower Cost	**4281039**
	Amt. Rs.	**4000000**	**163710**			**117329**	
August, 2023	Programme	-	Free Medical Services Through Mobile Health Care Unit	-	-	Salaries / Manpower Cost	**359687**
	Amt. Rs.		**163710**			**195977**	
September, 2023	Programme	-	Free Medical Services Through Mobile Health Care Unit	-	Distribution Of Saplings to Grama Panchayat and School Students	Salaries / Manpower Cost	**937676**
	Amt. Rs.		**163710**		**735500**	**38466**	
Total	Amt. Rs.	**4000000**	**818550**	**32450**	**735500**	**703759**	**6290259**

Community Infrastructure Development (Drinking Water Plants)

Community Health (Mobile Health Unit)

Community Health (Mobile Health Unit)

- Blood Donation camp under the theme of Go Red Drive was organized at APL, Udupi Plant premises and New Mangalore Port Authority facility.

Educational Initiatives

- Education Kits comprising of Notebooks, Bag, Compass Box and Umbrella were distributed to the students studying in Kannada Medium Government Schools.
- Totally 6,730 students were distributed with the education kits.
- 78 Government Kannada Medium Schools located in 39 villages in the rural areas of Udupi District were covered under this activity.

Comparison of Base Line Data of EIA Report (2009) with the Ambient air quality analysis report of September 2023

Annexure-VII

Location: Plant Site									
September - 2023					As per EIA Report - 2009				
Date of Sampling	SO_2	NO_2	PM $_{10}$	PM $_{2.5}$	Date of Sampling	SO_2	NO_2	PM $_{10}$	$PM_{2.5}$
	µg/m³					µg/m³			
07.09.2023	12.7	14.3	47.6	26.8	28.04.2007	BDL	12.5	138	45
08.09.2023	13.5	14.4	47.8	27.3	30.04.2007	BDL	9.5	121	41
14.09.2023	13.1	13.9	46.9	26.6	07.05.2007	BDL	15.0	148	47
15.09.2023	13.0	14.1	47.3	25.5	11.05.2007	BDL	8.0	92	35
21.09.2023	12.2	13.9	46.6	27.4	14.05.2007	BDL	9.5	132	43
22.09.2023	11.9	13.8	46.7	26.3	18.05.2007	BDL	8.5	118	38
28.09.2023	12.2	14.3	48.1	26.4	20.05.2007	BDL	10.5	138	45
29.09.2023	12.5	14.6	46.2	27.1	23.05.2007	BDL	8.5	85	30
Min.	**11.9**	**13.8**	**46.2**	**25.5**	**Min.**	**0**	**8.0**	**85.0**	**30.0**
Max.	**13.5**	**14.6**	**48.1**	**27.4**	**Max.**	**0**	**15.0**	**148.0**	**47.0**
Avg.	**12.6**	**14.2**	**47.2**	**26.7**	**Avg.**	**0**	**10.25**	**121.5**	**40.5**
NAAQ Standards (2009)	**80**	**80**	**100**	**60**	**NAAQ Standards (1994)**	**120**	**120**	**500**	**150**

Note: BDL-Below detection level

Location: Mudarangadi									
September - 2023					As per EIA Report - 2009				
Date of Sampling	SO_2	NO_2	PM $_{10}$	PM $_{2.5}$	Date of Sampling	SO_2	NO_2	PM $_{10}$	$PM_{2.5}$
	µg/m³				mg/m³	µg/m³			
07.09.2023	11.3	14.2	39.9	19.1	29.04.2007	5.5	31.5	120	65
08.09.2023	11.7	14.1	39.8	19.2	03.05.2007	6.0	34.5	135	72
14.09.2023	11.6	14.2	40.1	18.9	05.05.2007	5.5	30.5	130	68
15.09.2023	11.1	13.9	39.7	18.8	09.05.2007	5.0	28.5	102	57
21.09.2023	11.6	14.5	38.5	18.3	13.05.2007	5.0	32.5	112	60
22.09.2023	11.4	14.6	39.6	18.2	16.05.2007	6.5	38.5	138	72
28.09.2023	11.3	14.3	38.5	17.9	22.05.2007	6.0	36.5	141	74
29.09.2023	11.0	14.2	39.3	18.5	25.02.2007	6.5	32.5	118	68
Min.	**11.0**	**13.9**	**38.5**	**17.9**	**Min.**	**5.0**	**28.5**	**102.0**	**57.0**
Max.	**11.7**	**14.6**	**40.1**	**19.2**	**Max.**	**6.5**	**38.5**	**141.0**	**74.0**
Avg.	**11.4**	**14.3**	**39.4**	**18.6**	**Avg.**	**5.75**	**33.12**	**124.5**	**67.0**
NAAQ Standards (2009)	**80**	**80**	**100**	**60**	**NAAQ Standards (1994)**	**120**	**120**	**500**	**150**

Comparison of Base Line Data with the analysis report of September 2023

Annexure-VII

S.No	Parameters	Karnire (Surface water)		Nandikur Village		Santhoor Village		UNIT	Acceptable Limits as per IS:10500:2012	Permissible Limits as per IS:10500:2012
		As Per EIA-507.5 MU	Sep 2023	As Per EIA-507.5 MU	Sep 2023	As Per EIA-507.5 MU	Sep 2023			
1	Color	Colorless	BLQ	Colorless	BLQ	Colorless	BLQ	Hz	5	15
2	Odour		A		A		A	-	Agreeable	Agreeable
3	Taste		A		A		A	-	Agreeable	Agreeable
4	Turbidity		2.90		BLQ		BLQ	NTU	1	5
5	TDS	17222	88.00	8	55.00	16	25.00	mg/l	500	2000
6	pH	7.1	6.64	6.2	6.79	6.8	6.83	-	6.5 - 8.5	No relaxation
7	Alkalinity		10.00		23.00		10.00	mg/l	200	600
8	Total Hardness as $CaCO_3$		24.00		25.00		8.00	mg/l	200	600
9	Calcium as Ca		4.81		5.61		1.60	mg/l	75	200
10	Magnesium as Mg		2.91		2.67		1.0	mg/l	30	100
11	Iron as Fe	0.1	0.16	0.3	BLQ	1.5	BLQ	mg/l	0.3	No relaxation
12	Sulphate as SO_4	1096	9.16	1.9	3.73	2.1	BLQ	mg/l	200	400
13	Chloride as Cl	9264	33.65	8.6	10.39	9.6	6.93	mg/l	250	1000
14	Fluoride as F	0.5	BLQ	0.05	BLQ	0.1	BLQ	mg/l	1	1.5
15	Phenolic Compounds	0.04	BLQ	0.01	BLQ	0.02	BLQ	mg/l	0.001	0.002
16	Manganese as Mn		BLQ		BLQ		BLQ	mg/l	0.1	0.3
17	Zinc as Zn	0.02	0.14	0.02	BLQ	0.03	BLQ	mg/l	5	15
18	Arsenic as As	ND	BLQ	ND	BLQ	ND	BLQ	mg/l	0.05	No relaxation
19	Cyanide as CN		BLQ	ND	BLQ		BLQ	mg/l	0.05	No relaxation
20	Cadmium as Cd	ND	BLQ	ND	BLQ	ND	BLQ	mg/l	0.003	No relaxation
21	Chromium as Cr^{6+}	ND	BLQ	ND	BLQ	ND	BLQ	mg/l	0.05	No relaxation
22	Aluminium as Al		BLQ	ND	BLQ		BLQ	mg/l	0.03	0.2
23	Selenium as Se	ND	BLQ	ND	BLQ	ND	BLQ	mg/l	0.01	No relaxation
24	Lead as Pb	ND	BLQ	ND	BLQ	ND	BLQ	mg/l	0.01	No relaxation
25	Mercury as Hg	ND	BLQ	ND	BLQ	ND	BLQ	mg/l	0.001	No relaxation
26	Boron as B	ND	BLQ	ND	BLQ	ND	BLQ	mg/l	0.5	1
27	Residual Free Chlorine	NT	BLQ	ND	BLQ	NT	BLQ	mg/l	0.2	1
28	Nitrate as NO_3-N		1.08	ND	1.99		BLQ	mg/l	45	No relaxation
29	E.Coli	280	Nil	350	Nil	1800	Nil	MPN/ 100 ml	Shall not be detectable in any 100 ml sample	

Note: A- Agreeable, BLQ-Below Level of Quantification, ND-Not detectable, NT-Not Traceable & Nil-Zero

O/C

Annexure-VIII

adani
Power

REF: APLUdupiTPP/ENV/2023-24/ 0533.

26.09.2023

To,
The Environment Officer
Karnataka State pollution Control Board
Regional Office
Plot No-36-C, Shivalli Industrial Area
Manipal, Udupi - 576104

Sub: Submission of Environmental Statement for Financial Year 2022-23 in Form-V for 2x600 MW coal based Thermal Power Plant of Adani Power Limited, Udupi Thermal Power Plant.

Ref: 1) Consent for Operation No: **AW-334454 dated: 18.11.2022**
2) Environmental Clearance No: - **J-13011/23/1996-IA.II (T) dated: 01.09.2011**

Dear Sir,

With reference to the above cited subject, please find the enclosed Environmental Statement in Form-V for the financial year 2022-23 along with supporting data for 2x600 MW Coal based Thermal Power Plant of Adani Power Limited Udupi TPP.

Thanking you,

Yours faithfully

Authorized Signatory
Adani Power Limited, Udupi TPP

27/9/23

Encl: Environmental Statement in Form-V (FY 2022-23)

Copy to:
Member Secretary
Karnataka State Pollution Control Board
"Parisara Bhavana", #49 1st to 5th Floor
Church Street, Bengaluru – 560001

Adani Power Limited
Correspondence Address:
Yelluru Village
Pilar Post, Padubidri
Udupi 574113
Karnataka, India
CIN: L40100GJ1996PLC030533

Tel +91 820 270 3500
Fax +91 820 270 3345
www.adanipower.com

Registered Office: "Adani Corporate House", Shantigram, Near Vaishno Devi Circle, S. G. Highway, Khodiyar, Ahmedabad-382421

ANNEXURE

ENVIRONMENTAL STATEMENT FORM-V
(See rule 14)

Environmental Statement for the financial year ending with 31st March 2023

PART-A

i	Name and address of the owner/occupier of the industry	Mr. Arindam Chatterjee Station Head Adani Power Limited Udupi TPP Yelluru Village, Pillar Post Padubidri, Udupi District Karnataka – 574113
ii	Industry category Primary-(STC code) Secondary- (STC Code)	Large scale Industry- Red Category
iii	Production category –Units	2X600 MW Coal based Thermal Power Plant
iv	Year of establishment	Unit-I: 2010 Unit-II: 2012
v	Date of the last environmental statement submitted	Letter No: UPCL/PLANT/O&M/ENV/2022-23/471 Dated: 12.09.2022

PART-B

Water and Raw Material Consumption:

i. Water consumption in m^3/d

Process	: 15185.64
Cooling	: 192665.72
Domestic	: 57.31
Total	: 207908.67
Sea Water returned back to Sea	: 143081.38

Name of Products	Process water consumption per unit of products	
	During the previous financial year (2021-22)	During the current financial year (2022-23)
Power Generation (1410.94 MU)	0.00566 kl/kwh	0.00327 kl/kwh

ii. Raw material consumption

Name of raw materials	Name of Products	Consumption of raw material per unit of output	
		During the previous financial year (2021-22)	During the current financial year (2022-23)
Coal	Power Generation	0.424 kg/kWh	0.461 kg/kWh
Heavy Fuel Oil (HFO)	Flame Stabilization during power generation and start-up	Nil	Nil
Light Diesel oil (LDO)		0.000503 ml/kWh	0.000477 ml/kWh

*Industry may use codes if disclosing details of raw material would violate contractual obligations, otherwise all industries have to name the raw materials used.

ADANI POWER LIMITED * Yelluru Pilar Post Padubidri Udupi * THERMAL POWER PLANT

PART-C

Pollution discharged to environment/unit of output

(Parameter as specified in the consent issued)

Pollutants	Quantity of Pollutants discharged (mass/day) i.e., (**Kg/day**)		Concentration of Pollutants discharged (Mass/Volume)		Percentage of variation from prescribed standards with reasons
a) Water	Parameter	Results	Parameter	Results	No deviation
	Odour	Agreeable	Odour	Agreeable	
	Colour	Not Applicable	Colour	1.00	
	pH		pH	8.17	
	TSS	194.32	TSS (mg/l)	4.72	
	BOD	105.65	BOD (mg/l)	2.57	
	COD	524.93	COD (mg/l)	12.75	
	Oil& grease	BLQ	Oil & grease	BLQ	
	Arsenic	BLQ	Arsenic (mg/l)	BLQ	
	Lead	BLQ	Lead (mg/l)	BLQ	
	Mercury	BLQ	Mercury (mg/l)	BLQ	
	Total Cr	BLQ	Total Cr (mg/l)	BLQ	
	Hexavalent Cr	BLQ	Hexavalent Cr	BLQ	
	Phenolic Compounds	BLQ	Phenolic Compounds	BLQ	

b) Air	Unit-I (kg/day)		Unit-II (kg/day)	Unit-I (mg/Nm^3)		Unit-II (mg/Nm^3)	No deviation
	PM	1993.06	1775.66	PM	37.70	33.23	
	SO_X	31125.29	36935.31	SO_X	588.76	691.19	
	NO_X	8616.02	8005.72	NO_X	162.98	149.81	

Note: BLQ = Below Limit of Quantification

PART-D

HAZARDOUS WASTE

{As specified under the Hazardous and Other wastes (Management and Transboundary Movement) Rules, 2016}

Hazardous Wastes	Total Quantity (MT)			
	During the previous financial year (2021-22)		During the current financial year (2022-23)	
1) From Process	Used Oil	8.40 MT	Used Oil	19.11 MT
	Oil-Soaked Cotton waste	4.33 MT	Oil-Soaked Cotton waste	4.93 MT
	Discarded Containers	4.56 MT	Discarded Containers	3.11 MT
	Spent Ion exchange resins containing toxic metals	0.00 MT	Spent Ion exchange resins containing toxic metals	3.94 MT
	Paint Residue	0.00 MT	Paint Residue	0.00 MT
2) Pollution Control Facilities	Not Applicable		Not Applicable	

PART-E

*SOLID WASTES**

Solid Wastes	Total Quantity (MT)			
	During the previous financial year (2021-22)		During the current financial year (2022-23)	
a)From Process	Bottom Ash	5590.00	Bottom Ash	5328.30
b)From Pollution Control Facility	Fly Ash	51633.74	Fly Ash	39219.40
	Gypsum	402.41	Gypsum	657.04
c) Quantity recycled or reutilized	Fly Ash	41091.00	Fly Ash	36030.0
	Bottom/Pond Ash	17632.00	Bottom/Pond Ash	14,600.17
	Gypsum	244.51	Gypsum	610.17

ADANI POWER LIMITED * UDUPI THERMAL POWER PLANT * Yelluru Pilar Post Padubidri Udupi 574 113

PART-F

Please specify the characteristics (in terms of concentration and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

a) Hazardous waste: As per Hazardous and Other Wastes (Management & Transboundary Movement) Rules 2016, hazardous wastes generated in the industry are of five categories i.e., 5.1 Used Oil, 5.2 Oil soaked Cotton Waste, 21.1 Paint Sludge, 33.1 Discarded Containers and 35.2 Spent Ion Exchange resin. All these generated wastes are stored on the concrete platform in designated location and disposed to KSPCB/CPCB authorized vendors.

b) Solid Waste: Solid waste in industry is generated from process and pollution control facilities.

i. Bottom Ash is generated from the process of burning coal and is collected in the water impounding basin and the same is disposed to brick manufacturers & disposal to ash pond which is 3 km away from the plant.

ii. Fly Ash is generated from the process trapped in the electrostatic precipitators (ESPs) in dry form and stored in silos. Fly ash is disposed to various end users like cement manufacturers, brick manufacturers and Ready-Mix Concrete works.

iii. Gypsum is generated from the FGD (flue gas desulphurization) units when flue gas is passed through wet lime to remove Sulphur Di-oxides. Generated gypsum is disposed to end users like cement manufacturers, fertilizers industries and plasterboard manufacturers.

iv. Sludge generated from the STP was utilized as manure after drying and composting along with garden waste.

PART-G

Impact of the pollution control measures taken on conservation of natural resources and consequently on the cost of production

a) The Ambient Air Quality surrounding the coal handling facility is monitored through Online Continuous Ambient Air Quality Monitoring Stations and the Ambient Air Quality is within the prescribed limits throughout the year.

b) The coal conveyor belts are fully covered and installed with Dust Suppression system at transfer points for arresting the fugitive emissions.

c) The Units are equipped with Pollution Control Equipment such as Low NOx Burner, ESP & FGD (flue gas desulphurization) for controlling the Stack Emission.

d) Fly Ash generated is conveyed in dry form through conduits and stored in silos. Fly Ash is utilized by cement manufacturers, brick manufacturers and RMC works.

e) Gypsum generated is stored in closed yard and disposed to end users like cement manufacturers, fertilizers industries and plasterboard manufacturers.

f) ETP of 7200 KLD and three STP of each 20 KLD (total 60 KLD) is in operation and treated water is reused for green belt development/ gardening.

g) Water Sprinkling is undertaken in the Ash Pond for suppression of dust.

PART-H

Additional measures/investment proposal for environmental protection including abatement of pollution.

a) Wind shield installed in the coal handling plant for controlling fugitive emissions.

b) Three Rain Harvesting Ponds of capacities 73000 m^3, 73000 m^3 and 143000 m^3 are constructed for harvesting rainwater during rainy season and utilization in Cooling Tower and other purposes.

c) Organic Waste Converter is installed for converting food and green waste into compost and used in green belt/ gardening.

d) Deployment of Road Sweeping machine to reduce fugitive dust emissions.

e) Fly ash brick manufacturing plant is installed for production of fly ash brick and paver block for internal utilization.

f) Paper recycling unit is installed for recycling and reusing the wastepaper generated in the plant.

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PART-I

Any other particulars in respect of environmental protection and abatement of pollution

a) APL Udupi TPP is certified with ISO 9001, ISO 14001, ISO 45001, ISO 50001, ISO 55001, ISO 22301 and ISO 46001.
b) World Environment Day celebration to create Environmental awareness among employees and community by conducting various environmental competitions, workshops & presentations.
c) Nearly 1300 saplings were planted inside the plant on the day of world Environment Day - 2022.
d) Single Use Plastic (SuP) free plant, an initiative taken to mitigate the problems caused by single use of Plastic to environment.

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Caution Boards at Pipeline Corridor

Annexure-IX

Caution Boards are installed at every critical area like Road Crossing, Village areas throughout the 6 km pipeline corridor. Snapshots of the caution boards are placed below: